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Chemical Week

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Equipment makers gear up to meet rugged demands of new CPI processes. . . p. 45

New rubbers near market; 'synthetic natural' plant construction begins . . . . p. 53

Borrowed research speeds AviSun into polypropylene production. . . . . p. 71

Nationalism dims Philippines' luster as U.S. export market, investment site . . . . . p. 81

July 18, 1959

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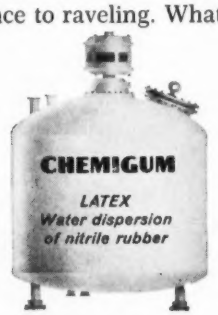

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Chemical Week

TOP OF THE WEEK

JULY 18, 1959

- **Merger of Stauffer and Victor** brings together basic chemical operator and consumer-strong concern .....**p. 26**
- **There's a swing to fluid-bed production of phthalic.** Here's how Cyanamid made the change, what it gained .....**p. 37**
- **Nonmechanical control for high ac. power** is based on thermoionic principle, features long life .....**p. 40**
- **Pfaudler Permutit makes strong bid in chemical specialties,** bolsters chemical department for move .....**p. 63**

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17 BUSINESS NEWSLETTER

25 Chemical deals with Russia? Kozlov and other Soviet officials tell U.S. executives: "Let's trade, for profits and peace."

26 Stauffer-Victor merger appears set, will integrate major phosphorus operations and broaden Stauffer's opportunities in ag chemicals and inorganic research.

27 Beryllium industry is growing up; sales outlook here and abroad improves as superlight metal finds increasing use in aircraft and atomic reactors.

27 Canadian concern to build $17-million nitrogen plant on St. Lawrence, will aim at both U.S. and Canadian markets.

30 Merck's newest overseas venture, drug plant in Thailand, will be first major industrial project there.

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37 ENGINEERING
Here's new look at Cyanamid's money-saving, versatile fluidized phthalic process.

40 Ovitron's new electro-ionic cell simplifies ac. power switching in automated control systems.

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The trend is to big equipment—to tame growing process temperatures, pressures.

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43,327 copies of this issue printed

Vol. 85
No. 3

Chemical Week is published weekly by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa. Second-class postage paid at Philadelphia. Subscription: $3/year in U.S.A. Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week. Please see page 8 for subscription requirements.

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CYANAMID

Chemical Newsfront

DUST AND LINT GET THE BRUSH-OFF from surfaces made from materials treated with CATANAC® SN *Antistatic Agent*. (triangle, left, above.) The outstanding quality of CATANAC SN is its ability to prevent the accumulation of static charge on a wide variety of substances including textiles, plastics, paper, surface coatings, glass and many others. Application is made by spray, brush, wiping, dipping, or, with plastics and resins, by incorporation into the molding composition. Materials containing CATANAC SN will retain their antistatic quality even after soap and water washings. This new antistatic agent is easy to apply and economical. It is ideal for use wherever undesirable static charge is present. **(Market Development Department)**

ELECTRODE HOLDERS ARE COLORFULLY INSULATED with LAMINAC® *polyester pre-mix molding compound*. Lenco Inc., maker of welding accessories, uses LAMINAC pre-mix in electrode holders because of its high impact strength, excellent flame and heat resistance, low moisture absorption, good electrical properties. The colors, red on tips and trigger, yellow on handle, are molded into the glass-filled LAMINAC for instant identification and safety. Lenco molds the parts in low-pressure compression presses, heated to about 350° F. Because LAMINAC has exceptionally good flow, high molding pressures are not needed to achieve sharp reproduction of mold contours. **(Plastics and Resins Division)**

UNIQUE TEST SPEEDS RUBBER'S WAR ON OZONE. Ozone can attack rubber, and cause such damage as cracked tire walls, severely shortening the life of rubber products. Cyanamid has recently developed an effective laboratory procedure for screening organic compounds as potential antiozonants. In this way, scientists can narrow the search through the many organic compounds to help determine which show enough promise to make actual field testing in rubber worth while. The screening method measures the ability of a compound to suppress reaction of ozone with a model unsaturated hydrocarbon. This latest tool in the war on ozone is already hard at work in Cyanamid's program to develop more effective antiozonants. **(Rubber Chemicals Department)**

GREATER DRY STRENGTH FOR PAPER PRODUCTS is being achieved in scores of mills with ACCOSTRENGTH® RESIN 2386. A synthetic, water soluble polymer, ACCOSTRENGTH 2386 is used for either stock addition or surface application to paper and paperboard. Improved dry strength is evidenced by higher tensile strength, greater folding endurance, added bursting strength and increased inter-fiber bonding and wax pick. ACCOSTRENGTH 2386 has unique ability to bring about greater dry strength with little change in bulk or porosity and thus proves highly valuable in the manufacture of printing papers and similar grades. **(Paper Chemicals Department)**

INSECTS DROP LIKE FLIES. Currently, over 100 formulators are using Cyanamid's MALATHION in insecticides. A unique phosphorus-sulfur containing compound, MALATHION harms neither man nor his animal friends. Yet it brings death, swift and sure, to bugs and insect pests by attacking vital nerve centers in their bodies. Malathion-base insecticides are used to protect fruits, vegetables, ornamentals, livestock and household pets. Its low toxicity to man and animals makes it one of the safest insecticides in the market today. **(Agricultural Division)**

For further information on products in this advertisement wire, phone—or mail this coupon to:

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This new Hooker research facility is now ready to cooperate with your research team—to promote industrial growth by developing new products and processes and by improving existing ones.

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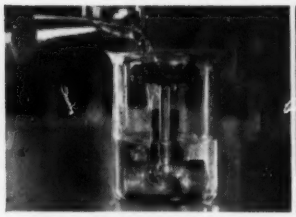
The industrial advances shown here, and many more, have come about as a result of creative Hooker research or of teamwork with Hooker customers.

A few things you can do now

Build a big plastic bubble that shrugs off 150-mile-an-hour winds but lets radar waves through and resists fire.

Power a rocket with high-energy solid oxidants, developed by Hooker working with other leading companies.

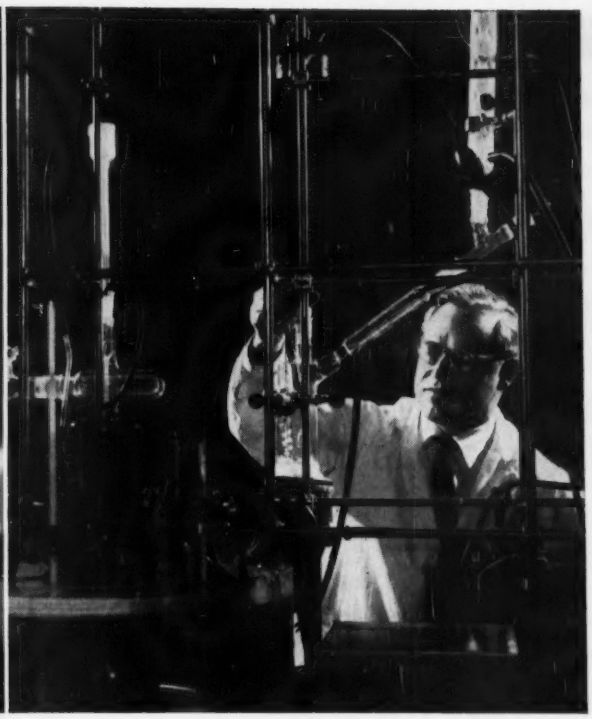


Put a super-hard corrosion-resistant nickel plating on any metal shape without using electricity.

Make strong corrugating board and newsprint paper from wood chips that haven't even been cooked.

Preserve foods or drugs with a new kind of sodium benzoate that dissolves instantly in water.

Strip the oxide scale off stainless steel or titanium in minutes . . . faster than pickling, without harming the metal.



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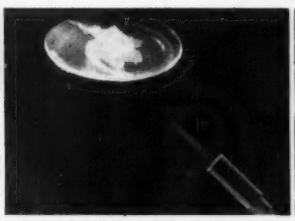
with Hooker products - that couldn't be done 10 years ago

Line a rocket exhaust nozzle with plastic so tough it stands a 5000° blast—keeps the metal skin from softening.

Make an insecticide, germicide, drug, dye, or nonflammable plastic—starting with **one** chlorine-loaded compound.

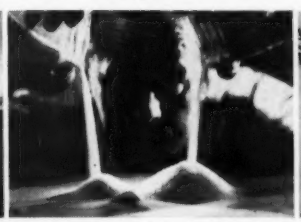


Lubricate with grease or oil that **won't** burn, or break down even in the presence of pure oxygen.

Degrease metal parts without having the bath go sour or require frequent cleaning out.

Install plastic ductwork that far outlasts metal under the bite of corrosive fumes, weighs much less, and can't contribute to a fire.

Set a new pace in building, with plastic foam light as a biscuit, strong as a board, that insulates, retards flame, costs less than other high-grade foams.



Make a detergent that wets better, dissolves faster, and stays free-flowing—because the phosphate in it consists of hollow beads.

Make plastic pump housings, gears, and even car transmission parts that outwear steel—and cost less, because they're molded rather than machined.

If you'd like information about any of the Hooker products referred to here, write us at 707-1Forty-seventh Street, Niagara Falls, N. Y.

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JULY 18, 1959 **Vol. 85, No. 3**

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION and ADVERTISING OFFICES: McGRAW-HILL BUILDING, 330 West 42nd St., New York 36, N.Y. See panel below for directions regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Keith Goodrich, Vice-President and Treasurer, John J. Cooke, Secretary; Nelson Bond, President, Publications Division; Harry L. Waddell, Senior Vice-President; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Circulation Coordinator.

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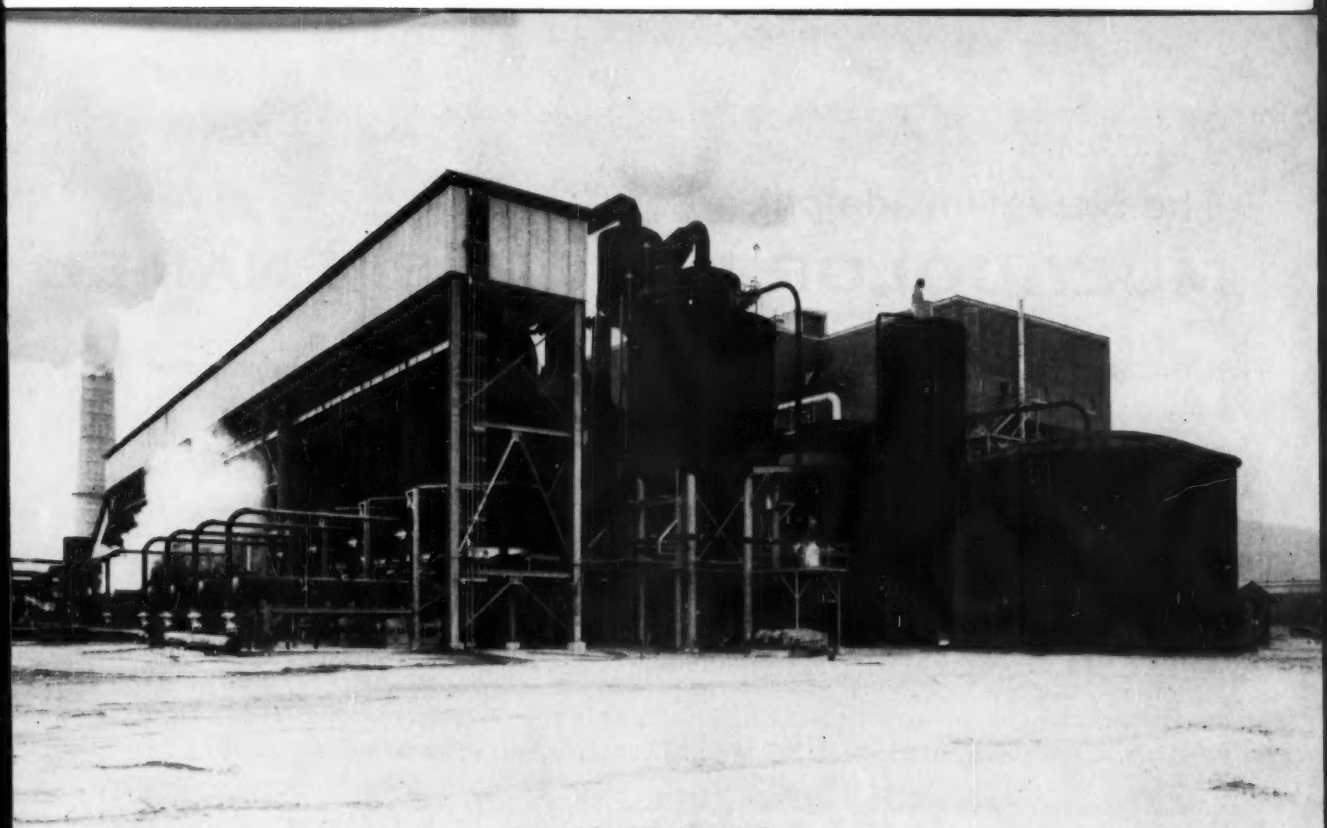

LUMMUS ENGINEERS AND CONSTRUCTS

Buckeye Cellulose Corporation's Wood Pulp Expansion

NATION'S OLDEST PRODUCER OF CELLULOSE PULP DOUBLES PRODUCTION CAPACITY OF FOLEY, FLORIDA, PLANT. The Buckeye Cellulose Corporation, America's oldest yet fastest growing cellulose pulp producer, will soon put into operation a new $20,000,000 wood pulp unit at Foley, Florida, thus completing an expansion program which doubles the plant's original production capacity.

The Lummus Company engineered and constructed the process units for these expanded facilities which assure Buckeye's customers a steady supply of highest quality Southern pine pulp. This new Lummus-designed plant is still another step in the growth of a company with 37 years of experience in producing cellulose pulp. Buckeye has the world's most complete line of celluloses, being the only producer of cellulose from both wood and cotton linters. Its cotton linter pulp mill was established in Memphis, Tennessee, in 1921.

Highest standards of processing are demanded by Buckeye to provide the best in cleanliness, brightness, strength and other specific qualities desired by users of Buckeye pulp. Long a research-minded company, Buckeye spends a higher percentage of sales on research activities than any other pulp producer.

In addition to engineering and constructing the process units for the Foley expansion, Lummus hired and coordinated various subcontractors for other portions of the plant. In spite of the complexity of such a large program, Lummus met the construction schedule and the new mill is assured a smooth start-up.

The Lummus Company has designed, engineered and constructed over 800 complete plants for the process industries throughout the world in the last 50 years. Lummus world-wide experience is at your disposal.

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ENGINEERS AND CONSTRUCTORS FOR INDUSTRY THROUGHOUT THE WORLD

385 MADISON AVENUE, NEW YORK 17, N. Y.

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The New "Philadelphia Story":

MULTICOLOR LACQUER* ENAMEL

In the Greater Philadelphia Area—as everywhere else in the nation—architects designing new buildings and remodeling old ones are turning to multicolor lacquer for the colorful emphasis that sets off their creative accomplishments to best advantage.

Requiring only normal techniques and equipment, multicolor lacquer makes it possible to spray two or more colors on a surface simultaneously as a single finishing coat. And multicolor lacquer can be applied to all surfaces—concrete, plaster, canvas, wood, wallboard, most plastics and metals. Different types of surfaces, therefore, can be merged into an integral area with this new type of coating. Economical to use, easy to maintain, multicolor lacquer is the answer to the search for a coating that is as modern as the plans on your drawing board.

Hercules Powder Company does not make finished lacquers or coatings of any kind but it does manufacture nitrocellulose, a basic material used in this multicolor lacquer. If you have difficulty securing adequate information on multicolor lacquer, write us and we will be glad to assist.

Multicolor lacquer enamel is manufactured under license from Coloramic Coatings, Inc., Los Angeles (U. S. Patent No. 2,591,904)

*Multicolor lacquer for all applications shown here is Zolatone, manufactured by Zolatone Process, Inc., Los Angeles, and distributed by M. Buten & Sons, Philadelphia.

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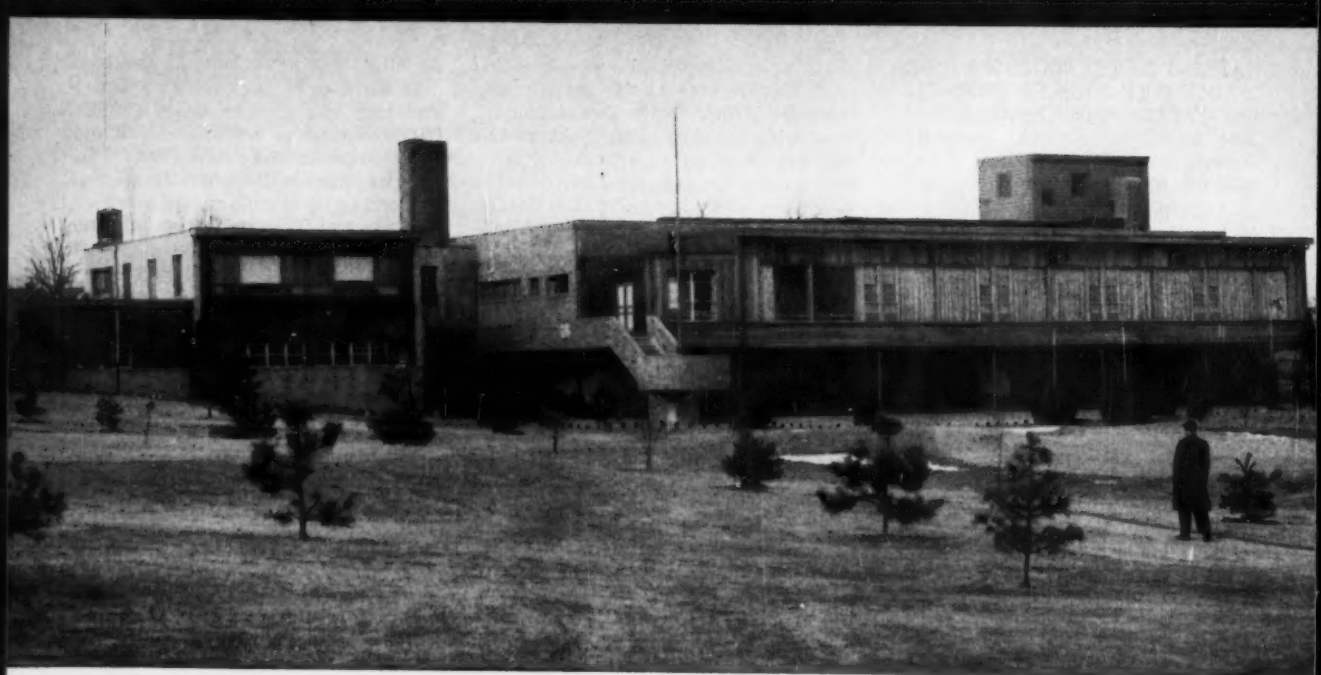


AT PLAY—The Green Valley Country Club makes extensive use of bright, decorative multicolor lacquer* in lobby, bar, and locker rooms—where high humidity is a challenge to any finish. Specifying architects were Demchick and Supowitz, Philadelphia.

AT THE OFFICE—For economical maintenance, interior offices and meeting rooms of the Deborah Foundation are finished with multicolor lacquer* that provides a pleasing background for the day's activities. Specifying architects were Supowitz and Demchick, Philadelphia.

AT HOME—The Elkins Park House, one of Greater Philadelphia's most modern apartments, uses easy-to-clean multicolor lacquer* for tasteful accent in the lobby and corridors. Specifying architect was Aaron Colish, Philadelphia.

AT THE MARKET
Multicolor lacquer* was used on the wall of this Penn Fruit market to accentuate the aluminum paneling and set off the modern decor of this new shopping center. Specifying architect was George W. Neff, of Philadelphia.

This advertisement is one of a series prepared to explain the suitability of multicolor lacquer enamels for a wide variety of architectural applications.

New York Times.

LATE CITY

NEW YORK, SATURDAY, JULY 4, 1959.

RULES OUT
EIGN HAND
N AFFAIRS

MOSES S
IS A 'DE
DECRIES

DISCUSS ENCYCLICAL: California's Gov. Edmund G. Brown, left, shows Frol R. Kozlov a newspaper account of the appeal for peace by Pope John XXIII. Mr. Kozlov, a First Deputy Soviet Premier, was guest in Sacramento.

RED CHINA ORDERS CHANGES IN TIBET

Program for Redistributing Land and Freeing Serfs Announced at Lhasa

Kozlov Offers to Support Even Pope to Gain Peace

By HARRY SCHWARTZ

SAN FRANCISCO, July 3—Frol R. Kozlov arrived in California today and said that "we'll even support the Pope if he's for peace."

The Soviet First Deputy Premier made the comment in Sacramento when Gov. Edmund G. Brown, who took him on a tour of the state capital, called his attention to a

ITALIANS TO BUILD ATOM SUBMARINE

Reported Seeking U.S. Data as Rome Plans a Major Expansion of Navy

By ARNALDO CORTESI

CW reporter (second from left) 'makes the papers' with Russians.

Comrade Kozlov—Up Close

CHEMICAL WEEK *reporter Bruce Bendow spent last week as one of the seven U.S. newsmen accompanying Russia's First Deputy Premier Frol Kozlov on his tour of industrial America.*

His perceptive report on the new developments on U.S.-Russian chemical trade appears on pp. 25-26. Below, Bendow outlines his general impressions of the man who may be next Kremlin boss.

If Frol Kozlov really wants to learn about the U.S., he is going about it in a strange way. For all his avowed interest in the proletarian class, he is managing (by his own choice) to see very little of it, except in the factories we've visited. In the plants, he makes a point of walking up to workers, warmly clasping their hands, and asking, "How are things going?" The workers invariably reply, "Fine." And Kozlov parts with "I hope they will go even better."

Yet he hasn't dropped in on any of the proletariat in their homes to see how they live. He hasn't taken the long, probing walks at night, which some previous Soviet visitors did.

Instead, Kozlov has made himself at home with the capitalists, and, apparently, the richer they are, the better. It's here that he thinks he can peddle his "line" to the greatest effect —at what he considers the power center of American policy.

He harps on the theme of trade. And I believe he is genuinely interested in trade for its own sake. And yet there is a peculiar glibness in the way he uses the word "trade" as he addresses groups of businessmen after a luncheon or dinner. He uses it in the same way, and in the same breath, as his other favorite word, "peace." And just as his talk of peace is contradicted by Russia's present policies— and by his own words in Washington 10 days ago—I get the feeling that he's using the word "trade" for effect.

U.S. Reaction: How is his audience reacting to his pitch? In general, I'd say he's playing to a slow house. So far, he got his greatest response in San Francisco, where his contacts with businessmen were social. He seemed to have no trouble setting off gales of laughter with his quips. He almost brought tears to the capitalists' eyes when he talked of his love for peace.

And his eloquence was almost outdone by his hosts' warm words of brotherhood and goodwill.

Some of my fellow observers attributed this enthusiasm to an eagerness to gain profits through trade with the Russians. I am more inclined to attribute it to a wishful naivete. I think the Americans were so eager for a solution of world problems that they tried to outdo each other in proclaiming their own friendship.

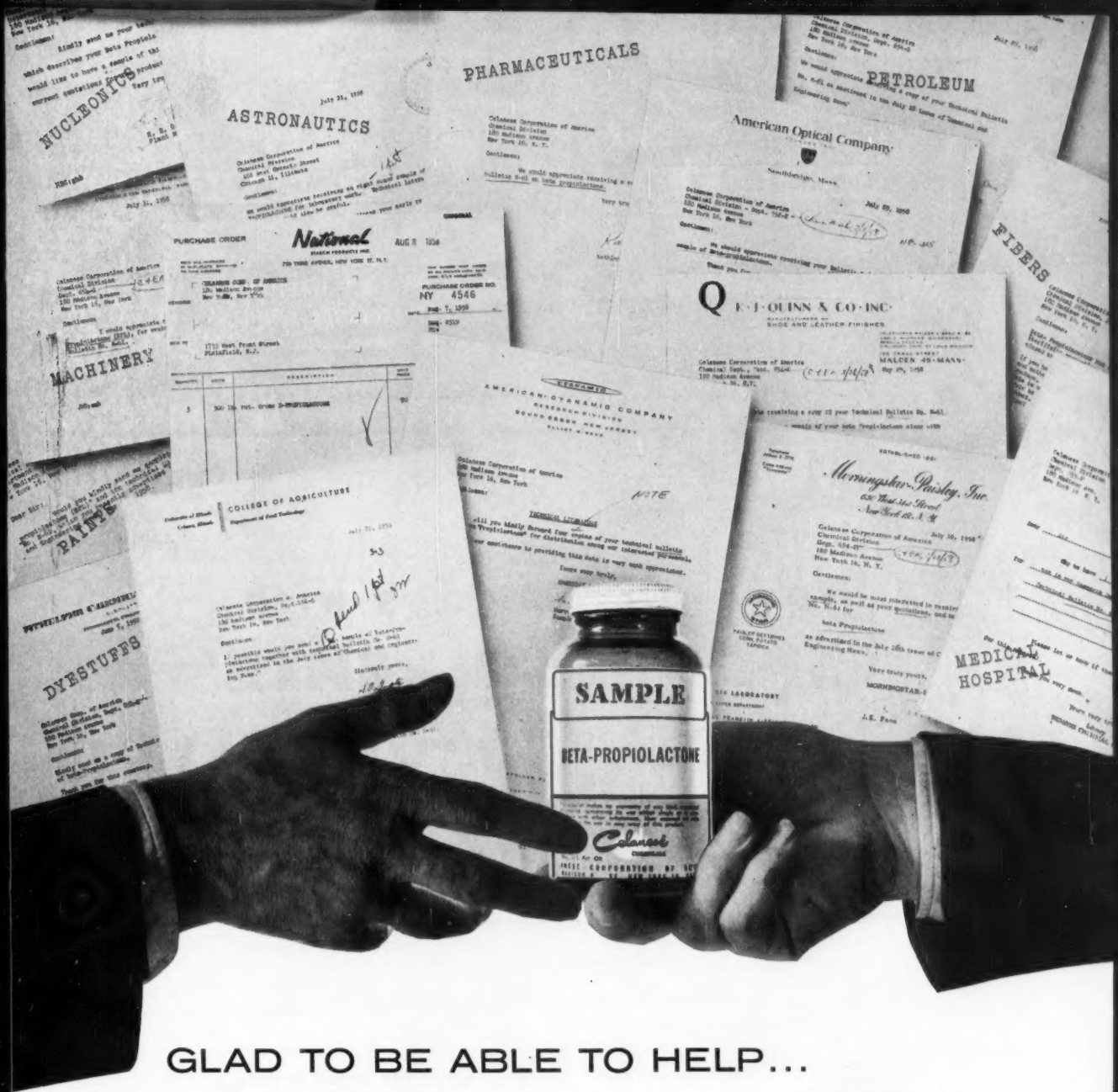
Moving east from San Francisco, Kozlov seemed to run into cooler weather. Perhaps he fooled some of his capitalist hosts but, on the whole, they appeared polite but not so warmly enthusiastic.

As for the proletarians, most of them didn't bat an eyelash. Kozlov has attracted no crowds anywhere, other than the mob of struggling reporters and photographers. The factory workers whom he shook hands with were polite, but asserted they were happy right where they were.

A waitress in a Detroit diner told me, "We don't care very much about him around here."

Said a lady in a San Francisco hotel: "Big deal."

Charm — on Stage: My own impression of Kozlov should already be apparent. He smiles charmingly for the crowd, but when he is offstage, he seems stern. Kozlov is certainly try-



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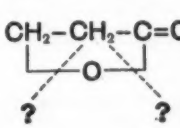

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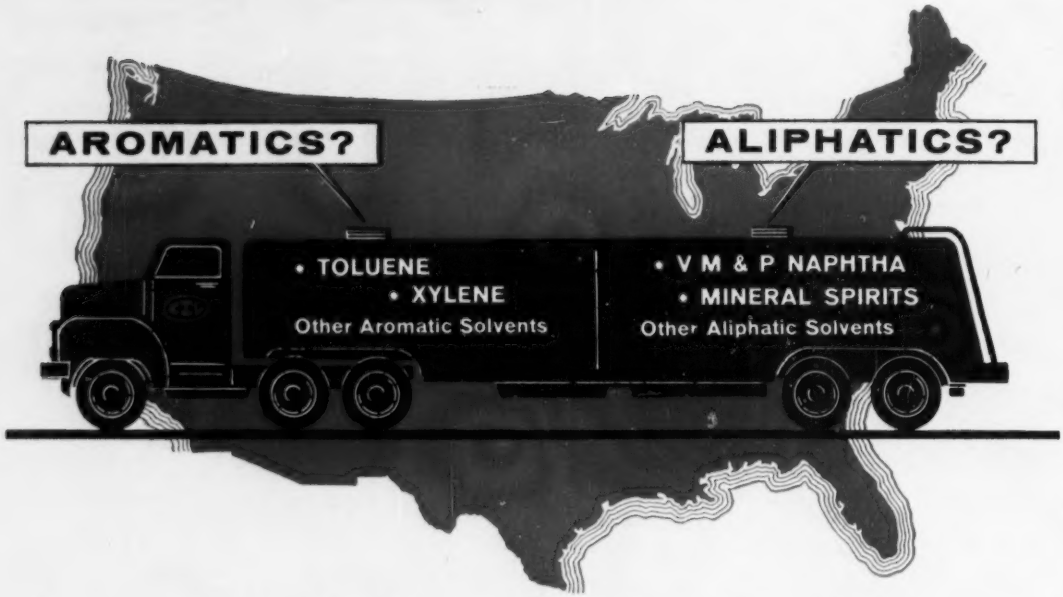

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ing to sell Russia to the American people—even if he has to fracture his dignity in doing it. I don't think it comes easy for him to don cowboy and sailor hats, or to pat little children for whom he has no reason to entertain the slightest concern.

But he can shake a hand warmly. And his rough-hewn, somewhat peasant-like character reveals a type of charm to which Americans respond.

Paradoxically, however, he has not made effective use of the best sales media, the press and television. Mikoyan's TV experience may have soured Kozlov, but he could have made safer arrangements. And perhaps lack of experience makes him hesitate to get too close to the press.

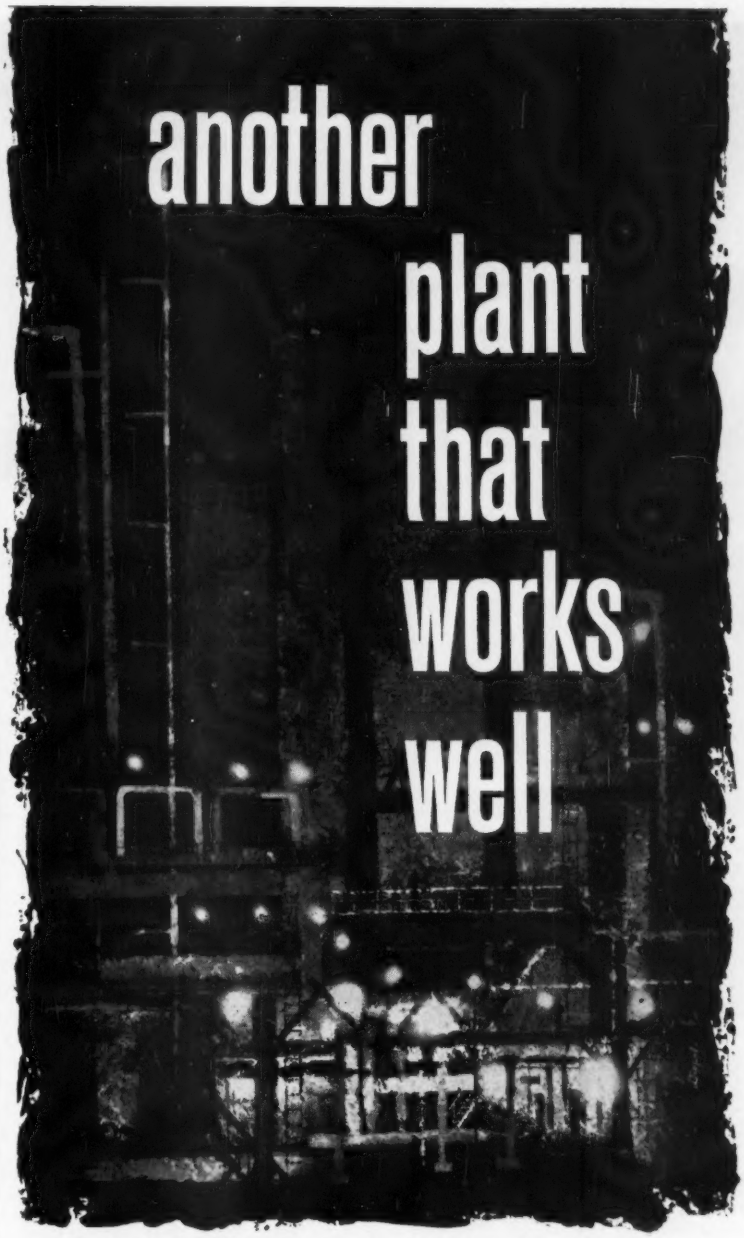
It's obvious that some of the critical stories about his cavorting—especially those of Harry Schwartz of *The New York Times*—have gotten under his skin. He has made several gibes about Schwartz, but he may well have toned things down as a result of such criticism. While, in San Francisco, he hefted himself onto a horse with a six-gun strapped around his ample waist, in Detroit he refused to get into a "levacar" for photos — unless Henry Ford accompanied him.

At the Detroit luncheon, Kozlov called Russian Ambassador Menshikov his "exploiter"—a term he has used before. During his morning tour in Chicago, Kozlov was even more restrained; and other members of the party also seemed a bit grumpy. Perhaps there had been an argument, which could well have concerned the impression Kozlov's performance was making on the public. But it's obvious that the Russians are sensitive to press criticism.

Men Around Kozlov: The impression one gets of Kozlov must be supplemented by what one thinks of the Russians traveling with him. They are pleasant to talk with, and I find some of them very likeable.

But after a conversation with even the most sophisticated of them, I come away with the discouraged feeling that the U.S. and Russia are miles apart, and that talk isn't going to get us very much closer.

They distrust us. They think we are warmongers. But they really do want peace—at least, on their own terms. And no matter how much we show them of the American way of life, they don't quite believe it.



The reason is still simple. Sound engineering, right from the start. Early joint efforts between company researchers and contracting engineers meant both quick start-up and a trouble-free plant design that has not and will not become dated.

Today, several top-flight process engineering firms serve the complex chemical industry. Vitro is one of these—*with an important advantage.* It has specialized in the hard-to-do jobs; the ones which haven't been done before or at best are new processes fresh out of the lab. This is Vitro's unique contribution.

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SHELL

Business
Newsletter

CHEMICAL WEEK
July 18, 1959

Near spectacular CPI earnings are coming in this week.

Allied Chemical's second-quarter sales touched a record high of $203.4 million, up 22%. Earnings almost doubled, were $16.6 million vs. $8.6 million in '58. In the first half, earnings totaled $27.9 million on sales of $372.5 million.

Pennsalt's six months' sales are expected to total $45 million, up 15%. Earnings will make an even more impressive showing, up more than 50%.

Other CPI branches are recording similar results:

National Gypsum Co. expects '59 profits of more than $26 million, compared with $15.6 million last year. Chairman Melvin Baker predicts sales will top $250 million vs. $163.2 million in '58.

In pulp and paper, Mead Corp.'s earnings for the 12-week period ended June 14 totaled $3.5 million, compared with $2.3 million last year. Sales were $75.2 million vs. $58.9 million in '58.

Burgeoning metals sales boosted Metal & Thermit's second-quarter sales to "over $11 million," compared with $8.4 million recorded a year ago.

The fiber industry is also rebounding rapidly. One indicator: American Enka set an all-time earnings record in the first 24 weeks of '59 when profits rose to $3.5 million vs. $4,700 in the same '58 period. For the 12 weeks ended June 21, sales totaled $26.3 million, compared with $12.1 million a year ago. Net income hit $2.1 million vs. a net loss of $360,000 in '58's second 12 weeks.

•

Another big oil firm is about to become big in petrochemicals.

Tidewater Oil Co. is now talking with major chemical companies about possibilities of setting up joint subsidiaries, and is blueprinting a long-range, worldwide petrochemical program that would involve new investments of hundreds of millions of dollars.

As first steps in this program, look for Tidewater to soon launch major expansions of its principal refineries—probably a $50-million project at Avon, Calif., and a $10-million job for the giant facility at Delaware City, near Wilmington.

Tidewater—which last November moved its headquarters from San Francisco to a new, $10-million office building on Wilshire Boulevard in Los Angeles—has just designated an officer to head this program. H. Y. Hyde—formerly vice-president for manufacturing—is now vice-president for manufacturing, marketing and petrochemicals.

One of the companies with which Tidewater has been negotiating: Monsanto, joint owner, with Tidewater, of the 80,000-tons/year sulfuric acid plant adjacent to Tidewater's Avon refinery. One company not in the running: General Dynamics.

Just last month, Tidewater declared that it will build and operate a $5-6-million natural gas cycling and desulfurization plant in Franklin County, Texas. This plant will daily be able to remove from raw gas 7,480 bbls. of distillate, 1,040 bbls. of propane, 550 bbls. of butane, and 224 long tons of sulfur.

•

Two other expansion items loom large in this week's news:

• Amoco Chemicals will put up a plant at Joliet, Ill., to produce high-impact and conventional polystyrene via a process developed by Standard Oil of Indiana researchers. A small plant is to be in operation by next spring, turning out a variety of polymers for customer evaluation; a commercial-scale plant is scheduled for completion for autumn of '61. Total expenditure: several million dollars.

• Ciba Products Corp. will build a 10-million-lbs./year epichlorohydrin plant at Toms River, N.J., to supply raw material for production of epoxy resins. The new plant—to be onstream in June '60—will use allyl chloride as starting material.

•

Oronite Chemical will merge market research and product development into a single, expanded corporate wing—the Commercial Development Dept. Word is that in this reorganization Oronite—a Standard Oil of California subsidiary—will add a large number of new products to its line, will greatly step up product development and market research activities.

•

Texas International Sulphur Co. is more than a little miffed as a consequence of an erroneous story in Mexico City newspapers last week.

The story reported that the Mexican government had canceled the company's sulfur concessions on the Isthmus of Tehuantepec because of "moral and economic" insolvency.

But a check with Salvador Pena—who heads the Mexican government's mining division—revealed that the government had merely asked for a review and clarification of some "secondary points concerning (Texas International's) investments."

Actually, the company says it's about to start producing Frasch-process sulfur at the rate of 9,000 tons/month. A company spokesman says the story may have been part of a ruse conceived by groups wanting to buy Texas International stock at bargain prices.

m-m-m-mm!

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A little weight reduction can go a long way in trimming Multiwall costs. Union Packaging Specialist Bob Buck demonstrated just how far during a study of one company's bagging operation.

The company had been using a baler bag of 160# total basis weight. Union's analysis proved that a 70/70 bag would be equally effective. The 20# reduction resulted in a savings of $35,000 a year.

This economy came through Union's 5-Star Packaging Efficiency Plan. Among the other improvements were: (1) A new, revised specifications manual which simplifies and streamlines inventory control. (2) Standardization of all bag printing. This assures delivery of completely uniform print copy from the firm's various suppliers.

Union's plan is producing thousands of dollars worth of savings for Multiwall users, large and small. It might point the way to a greater return on your packaging investment. Write for details.

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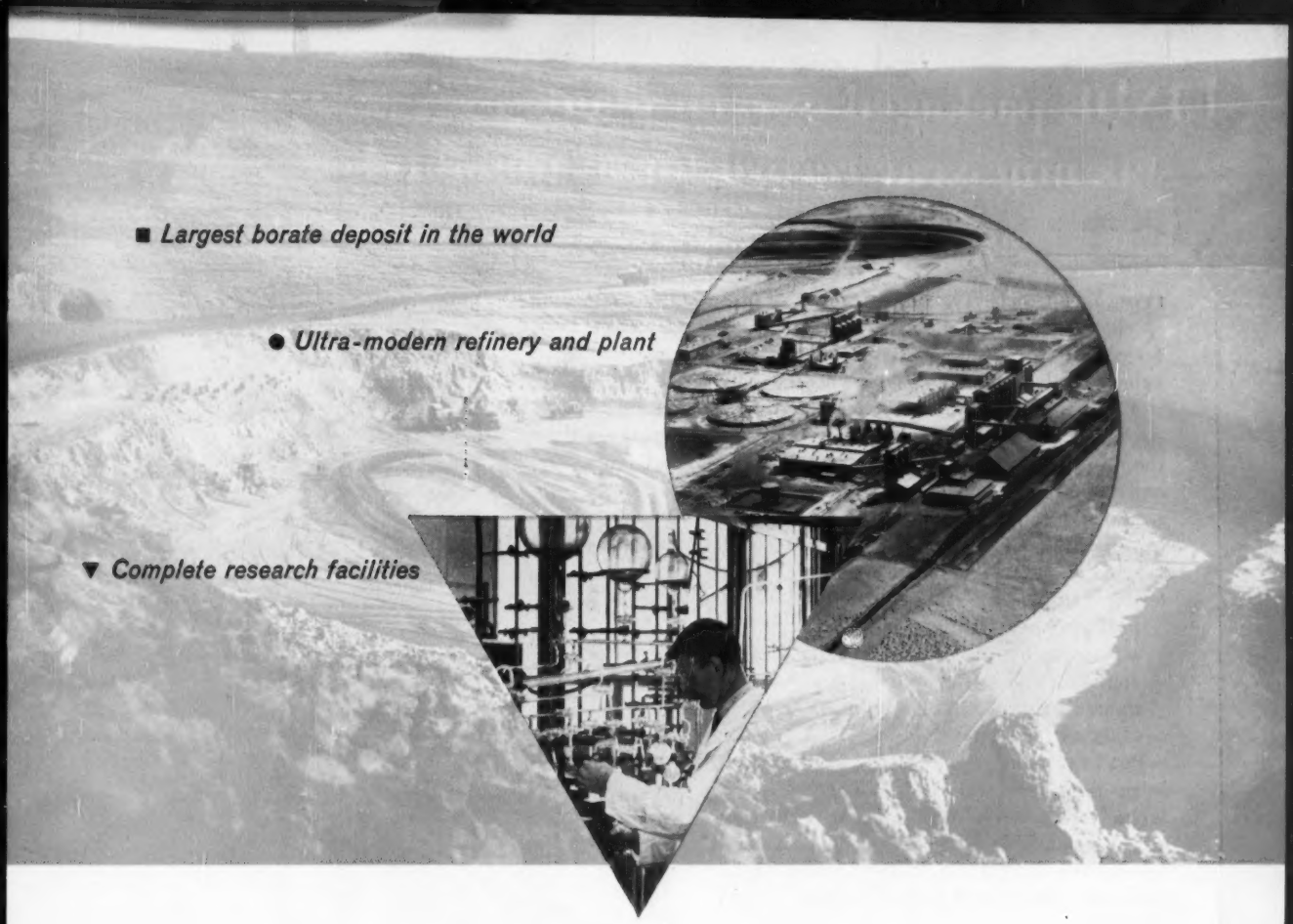

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THE LINDE oxygen plant shown here has been serving a leading chemicals producer "over-the-fence" continuously since 1949. Its operating log shows a 98%+ availability factor. Next year, capacity will go up from 360 to 800 tons of oxygen a day.

You can expect the same continuity of supply with a LINDE packaged plant serving your process. Your LINDE plant will be the product of fifty years' experience in the design, manufacture, and operation of air separation plants and low temperature equipment. LINDE is uniquely qualified to provide air separation plants for the supply of oxygen and/or nitrogen as well as the associated low temperature equipment for:

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purifying hydrogen and helium
separating hydrogen from coke oven gas
ammonia and methanol synthesis
upgrading of natural gas
other extremely low temperature processes.

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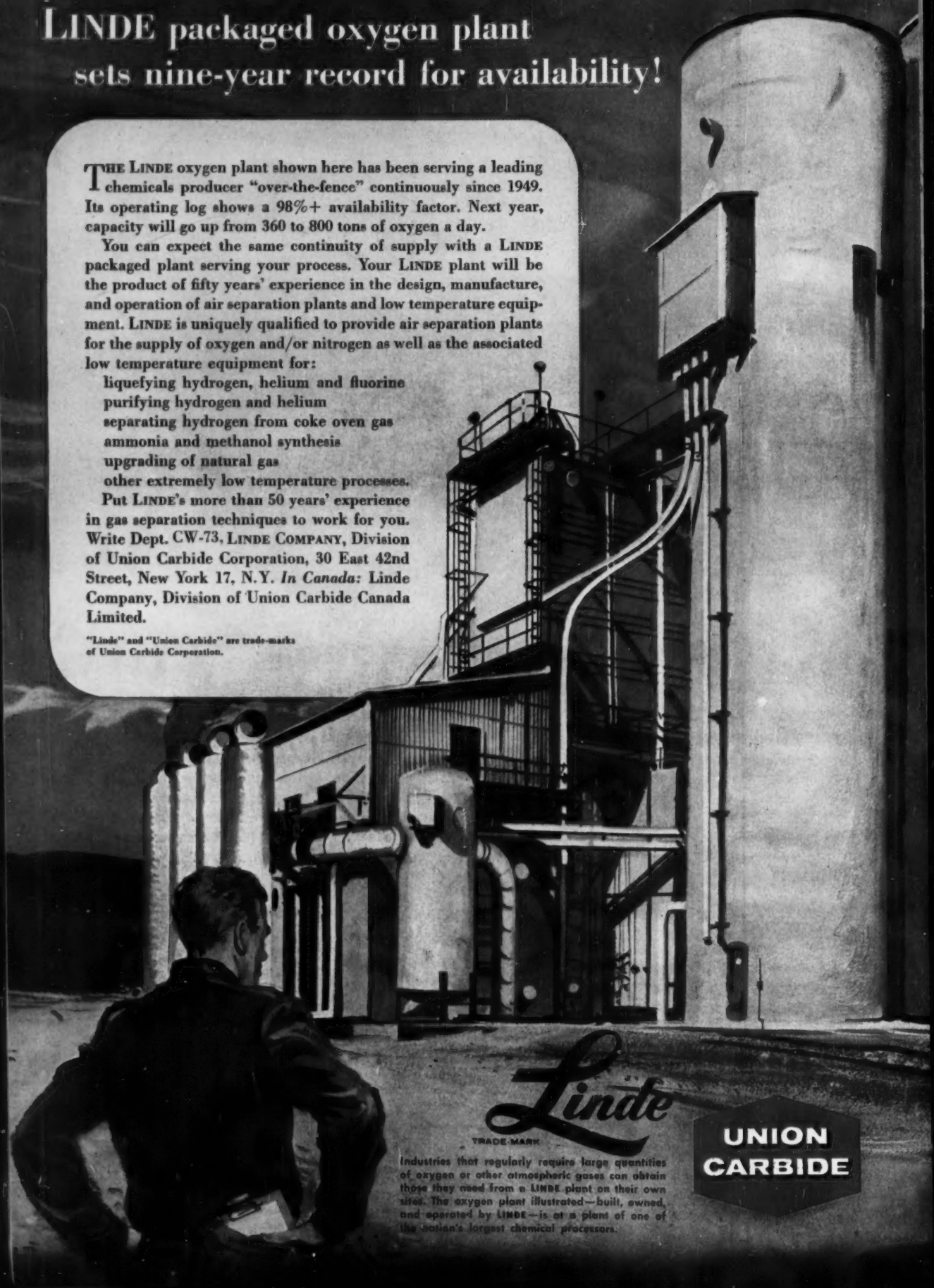

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Industries that regularly require large quantities of oxygen or other atmospheric gases can obtain those they need from a LINDE plant on their own sites. The oxygen plant illustrated—built, owned, and operated by LINDE—is at a plant of one of the nation's largest chemical processors.

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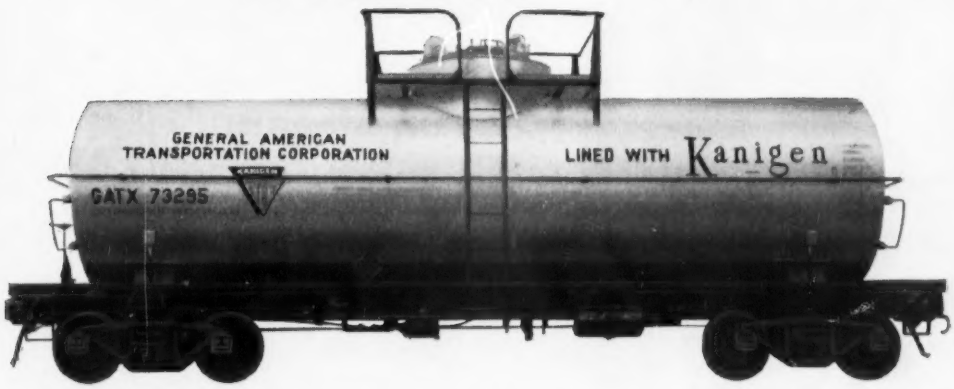

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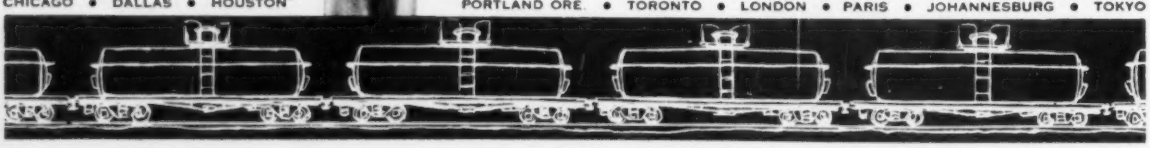
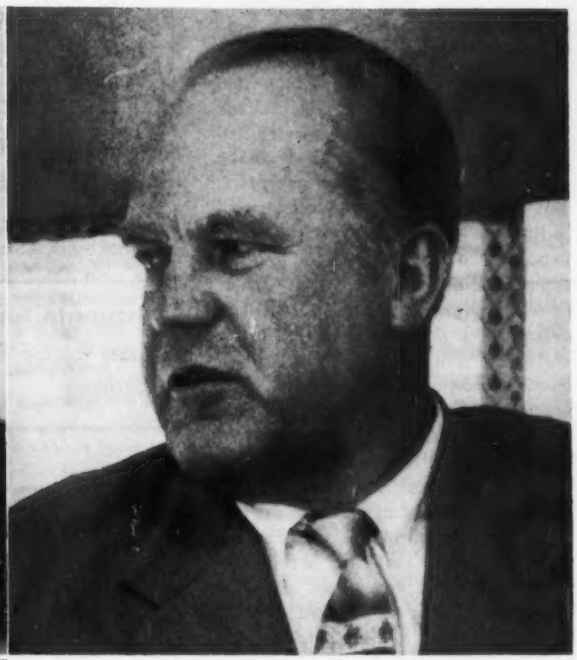




CW PHOTO—J. SYDLOW

Kuzmin: 'Talks with U.S. firms are continuing.' **Bolshakov: 'Why be afraid to trade? We aren't.'**

Reds Talk Sweet for U.S. Trade

Top Soviet trade officials invaded the U.S. in force last week in an all-out effort to woo U.S. businessmen into a more favorable attitude toward Soviet trade. The Russians were authorized to place large orders with U.S. firms as well as sell big quantities of Soviet goods.

"We have lots of money," their chemical equipment buyer assured *CW*.

To push the Soviet cause, First Deputy Premier Frol Kozlov went on a barnstorming tour of major U.S. cities. He was accompanied by 11 Soviet and seven U.S. journalists, Deputy Foreign Trade Minister Ivan Bolshakov, Ambassador Mikhail Menshikov, and an entourage of assorted officials.

250 Sales Calls: In New York, Deputy Trade Minister M. R. Kuzmin and 11 subordinates—just returned from talks with more than 250 U.S. firms—were doing their bit to drum up business at the Soviet Exposition in the Coliseum (*CW, July 11, p. 48*). All emphasized that Russia wants "peaceful coexistence through trade," and that potentially profitable Russian-U.S. trade has fallen off because the U.S. has set up artificial trade barriers.

This typical Soviet view was vigorously voiced by Ivan Bolshakov in an exclusive *CW* interview aboard (*see also p. 12*) Kozlov's plane en route to California.

"We are not afraid of trading with the U.S.," said the Soviet trade chief, "so why should it be afraid of trading with us?"

He was replying to the speech by Esso Standard Oil Vice-President Osgood V. Tracy at the recent Manufacturing Chemists' Assn. meeting in White Sulphur Springs, W.Va. Tracy said the sale of U.S. advanced chemical technology to Russia would further the U.S.S.R.'s stated aim of defeating the U.S. in economic warfare.

"With no assistance from the outside," Bolshakov snapped, "we will win this economic competition. But we consider trade to be the basis for peaceful coexistence," he added.

Ores - for - Equipment: Bolshakov, like his traveling companion Kozlov, stressed the Soviet's desire to trade, but was not prepared to talk details. He sounded the familiar themes: Russia wants machinery, especially chemical equipment. It wants a trade pact with the U.S. In exchange for the equipment, it wants to sell the U.S. raw materials, e.g., manganese, chromium, cellulose.

In trade with the U.S., Bolshakov said, Russia would pay in gold or dollars. It would prefer credit and balanced trade, but neither is necessary.

Skeptics maintain that, under the guise of trade, the Russians hope to disrupt prices by dumping materials on the world market; become politically as well as economically involved with non-Communist nations; dispose of temporary surpluses at any price.

Denies Dumping: Bolshakov force-

fully denies the dumping charge. "Whatever we sell is at world prices," he insists. Specifically, he denies that aluminum and tin were dumped at cut-rate prices. Such stories, he says, were manufactured by countries that want to discredit the Soviet Union.

What about Russian benzene that comes into the U.S. at 5¢/gal. below the domestic price? "In individual countries," he says, "products will be sold at lower than the domestic price. But not lower than the world price."

Bolshakov also denies that Russian exports such as benzene and aluminum represent surpluses that will dry up as Soviet internal consumption expands. Russia, he says, can sell raw materials and equipment now, and will be able to sell more of both at the end of this seven-year plan. There is, he contends, a solid basis for permanent trade relations between Russia and the U.S.

"A division of labor has already been formed among nations of the world. For its normal economics development, this division of labor should be further developed," Bolshakov says. He admits "it's hard to say" how a move to increase U.S.-Soviet trade would work out, since both nations are heavily industrialized and both countries have broad raw-material bases.

Russia, he says, now holds sixth place in world trade, wants to double foreign trade within seven years. But this is to be done, he says, "on the basis of healthy competition."

Almost precisely the same line was uttered by Bolshakov's subordinate, Deputy Minister Kuzmin, in a press conference late last week at New York's Coliseum. And all the others in Kuzmin's party—including chemical equipment buyer M. A. Chekmarev—seemed to be using the same script.

No Contracts: No major deals were actually consummated. But the Russians insist that "negotiations are continuing" with companies visited by trade officials.

Some observers say that this may well be the case, that some U.S. firms, particularly makers of chemical equipment—for which the Soviets are willing to pay a high price—may have left the door open for further talks.

But the number of companies that would genuinely benefit from such trade is small; the Soviets likely will have little to show for their trade-seeking visit to the U.S.

Stauffer-Victor Merger's Key Statistics

(all dollar figures in millions)

	STAUFFER	VICTOR	COMBINED
Plants	47	9*	56*
Employees	4,530	2,636	7,166
As of Jan. 1, 1959			
Net fixed assets	$ 67.2	$28.0	$ 95.2
Total assets	$145.5	$49.2	$194.7
Stockholders' equity	$114.8	$33.9	$148.7
Estimate for 1959			
Sales volume	$165	$60	$225
Earnings	$ 15.5	$ 4.5	$ 20

* Including phosphoric acid plant under construction at Dalton, Ill.

New Phosphate Alignment

A big new chemical company—with the most widespread phosphate operations in the industry—will be created later this year if stockholders of Stauffer Chemical Co. (New York) and Victor Chemical Works (Chicago) ratify the merger plan their boards of directors agreed on last week.

Stauffer itself, of course, has a long list of chemical interests—agricultural chemicals, chemical minerals, and numerous industrial chemicals. And Stauffer's 10 domestic and nine foreign subsidiaries and affiliates are in such diverse fields as petrochemicals, pharmaceuticals, propellents and metallurgy, as well as chemicals.

But particular attention centers on the phosphate holdings that—directly and indirectly—would be linked if the proposed merger goes through.

Victor has always been primarily in the phosphate business; its phosphorus products now number in the hundreds. It operates phosphate mines in Montana and Tennessee, has additional ore reserves in Florida. Its research program is heavy on phosphorus chemistry.

Now look at Stauffer's phosphate interests:

Stauffer holds important phosphate rock ore lands in Idaho, Utah and Wyoming, operates superphosphate plants in Tacoma, Wash., and Los Angeles and Richmond, Calif.

Stauffer is 50% owner of San Francisco Chemical Co., which does the mining on some of Stauffer's phosphate lands and also has extensive phosphate ore holdings of its own.

Just last week, these holdings were increased considerably when the firm acquired control of the entire west limb of the Crawford Mountain syncline, an eight-mile stretch of land five miles south of Leefe, where the company has its principal mining, beneficiation, calcining facilities.

Also at Leefe, the company is planning to construct a defluorinating unit to produce phosphate material for use as animal feed supplement.

Stauffer is 50% owner of Western Phosphates, Inc., which recently expanded its high-analysis phosphate fertilizer plant at Garfield, Utah. This plant also draws its phosphate rock supplies from Utah, Idaho, Wyoming, an area that contains more than half of the nation's known phosphate deposits.

Stauffer already has expanded its new phosphate-insecticide plant at Henderson, Nev.; and the company's researchers have been considering phosphorus chemicals in connection with work on such projects as inorganic polymers, high-energy fuels, and pesticides.

A merger would have major impact on the phosphorus chemicals outlook. And right now, it appears that merger is a virtual certainty.

Beryllium Boom Beckons

Beryllium makers, long plagued by sharp ups and downs in demand, now see their greatest wave of prosperity starting. The record earnings expected in '59 likely presages greater profits. The gain reflects: new technology, the prospect of greatly stepped-up use in missiles and atomic reactors.

Evidence of one producer's optimism came last week when Beryllium Corp. (Reading, Pa.) formed a new British company, Consolidated Beryllium Ltd., with Imperial Smelting Ltd., a subsidiary of Consolidated Zinc Corp., London (*CW Business Newsletter, July 11*).

Biggest Plant Planned: The firm will turn out beryllium at a new plant, which the parent companies say will be the "largest beryllium unit in the world." Preliminary design work has already started, though no details have been revealed.

The new company will also operate a plant abuilding at Avonmouth, England, slated for completion later this year.

Behind the beryllium buildup in Britain are projected needs for 200,000 lbs./year for that country's nuclear power reactor program. Only other producer in Europe is the French firm Pechiney, which isn't large enough to supply Britain's needs.

Relying on Imports: In the U.S., total use of beryl ore is expected to reach 7,500 tons this year—compared with 6,200 in '58. Shipments from U.S. mines will be about the same as '58's 520 tons, with the government buying most for stockpiling. Because of the poor quality of domestic deposits and the resulting high cost of mining them, U.S. producers import ore from Asia, South America and Africa, some from Europe.

The only two producers of beryllium metal in the U.S., Brush Beryllium and Beryllium Corp., are now turning out a total of 80,000 lbs./year. They refined 50,000 lbs. in '58, 40,000 lbs. in '57.

Both have contracts, running another four years, to supply 37,500 lbs./year to the Atomic Energy Commission. Originally, both these contracts were for 100,000 lbs. annually; but last year, AEC decided to cut its requirements. For '59, however, both U.S. firms have landed substantial Air Force and Navy contracts, which will more than offset AEC's cutbacks. The metal has about the temperature performance of steel, has a higher tensile strength than aluminum, and weighs about as much as magnesium.

Details of the new pacts are still under security wraps. But it is known that the Navy's Polaris missile will have large quantities of beryllium in its airframe and guidance system—as will other missiles. More new power reactors for ships and utilities help brighten prospects for the metal.

Extrusion Technique Gains: Another boost for large-scale usage will come from improved extrusion techniques now being worked out. Extrusion of beryllium increases its tensile strength, improves other properties, e.g., ductility and hardness—and is a much less costly fabrication method than conventional machining.

So far, U-shaped channels of aircraft quality have been extruded in lengths up to 12 ft. This week, Nuclear Metals Inc. (Concord, Mass.)—which is currently working on the technique as a subcontractor for Northrop Aviation—will try for shapes 20 ft. long.

Some improvements, however, are still needed before extrusion is completely workable.

Among needs: new lubricants to improve finish, maintain quality in production runs; better processing temperature controls; improved extrusion reduction ratios and speeds; better die design and die materials.

Says Northrop executive John Van Hamersveld: "We hope to achieve aircraft-quality beryllium extrusion in popular shapes and sizes, have them available within two years."

Price Cut Coming: In addition, the early '60s may also see a price cut on the metal. It's currently selling for about $60/lb., but veteran industry men say new demands should be large enough to slash production costs, pave the way for the price reduction.

And, with beryllium's growing sales prospects, it's likely other firms will evaluate getting into the business. However, present producers don't see competition coming in right away. Beryllium Corp. Vice-President Larry Boland warns: "Others will have a tough time getting into this field. The technology is particularly difficult and we've got experience that will be hard to duplicate."

In any case, beryllium prospects have taken on new luster since the beginning of '59, with the snowballing demand for missiles and reactors. And, though '59 seems sure to see the biggest year-to-year earnings rise in the industry's history, producers believe even bigger gains are on tap for the '60s.

New Entry in Nitrogen

Canada, a big synthetic nitrogen importer, may be in an export position soon—Sogemines Ltd.'s proposed $17-million plant will put capacity above anticipated domestic demand. Contributing output, too, will be Cyanamid of Canada.

Sogemines, a Canadian company affiliated with Societe Generale de Belgique (Brussels), plans the facility for Maitland, Ont., may have it onstream by early '61. The plant, on the St. Lawrence River about 100 miles upstream from Montreal, will be fed natural gas from Alberta fields. Output will include ammonium nitrate, nitrogen solutions, anhydrous ammonia and hydrogen.

Most of the anhydrous ammonia and hydrogen will be sold by pipeline to the nearby Maitland Works of Du Pont of Canada, under a long-term contract.

Sogemines intends to sell the other products in two major market areas:

In eastern Canada, it will largely sell fertilizers; but some of the ammonium nitrate will be offered for use in explosives for the growing new iron mining regions of northern Quebec.

It will also offer the fertilizers in eastern New York and in New England.

Cyanamid of Canada is starting up its new urea plant at Hamilton, Ont., and some of this plant's production is likely to be for export. Canadian Industries Limited has a new ammonia plant at Millhaven, Ont.; and Sherritt Gordon Mines recently completed a synthetic ammonia plant at Fort Saskatchewan, Alta. Older nitrogen plants in Canada: Dow's ammonia unit at Sarnia, Ont.; Cyanamid's ammonium nitrate plant at Port Robinson, Ont.; and Consolidated Mining & Smelting Co.'s two ammonium nitrate plants at Trail, B.C., and Calgary, Alta.

COMPANIES

Armour & Co. (Chicago) has formed a new subsidiary—Armour Industrial Chemical Co.—to take over the parent company's fatty acids, fatty nitrogen derivatives and ammonia operations. Armour's 33 fertilizer plants—including the 240-tons/day ammonia plant at Festus, Mo., recently acquired from Mississippi Valley Fuel Co.—will continue to be operated by Armour Agricultural Chemical Co.

•

Novamont Corp., the Montecatini subsidiary that will operate the $10-million polyolefin plant to be built at Neal, W.Va., will buy its feedstock from Ashland Oil & Refining Co. Novamont President Lucio Lucini said his company expects to take about 11 million lbs./year of liquefied hydrocarbons from Ashland's refinery at Leach, Ky., just across the Big Sandy River from the Novamont plant site.

•

Unexcelled Chemical Corp. (New York) has acquired Aylward Chemical Co. (Sullivan, Ill.), producer of liquid fertilizers, with plants at Sullivan, El Paso, Rochester and Harvel, Ill. Unexcelled Chemical reportedly issued about $500,000 worth of common stock for the acquisition.

•

Powell River Co. and **MacMillan & Bloedel Ltd.** (both Vancouver, B.C.) are planning a merger that will be one of the largest in Canada's industrial history. The merged forest products combine will be "worth considerably more than $400 million." Reason for the move, according to Chairman J. V. Clyne of M&B and Chairman Harold Foley of Powell River, is to pool resources so as to meet stiffer competition from U.S. companies. Both firms produce newsprint and sulfate pulp. In addition, Powell River is building facilities to produce fine paper and hardboards; M&B produces lumber, plywood, kraft paper and paper bags.

EXPANSION

Pulp and Paper: Noralyn Paper Mill (Baton Rouge, La.) will build a 400-tons/day newsprint and semi-chemical pulp plant on a 750-acre tract at Beuche, La. (about four miles north of Baton Rouge). Design and construction engineers for the $30-40-million facility: Ferguson Co. (Cleveland). Noralyn Vice-President John Gatti says this will be the first mill to produce high-quality newsprint and pulp exclusively from hardwood timber.

•

Tall Oil: Hercules Powder Co. (Canada) plans to build at Burlington, Ont., a $1-million-plus plant for fractional distillation of crude tall oil—first of its kind in Canada. This plant, at the site of Hercules' paper chemicals operation, will produce rosin and fatty acids. Crude tall oil will be obtained from a group of Canadian kraft pulp manufacturers.

•

Pharmaceuticals: Parke, Davis & Co. (Detroit) has named Darin & Armstrong Co. (Detroit) as general contractor for construction of a $7-million chemical manufacturing plant at Holland, Mich. Completion date: late '60.

•

Organic Intermediates: Treplow Products, Inc. (Paterson, N.J.) is building a plant near West Paterson, N.J., to more than triple present over-all capacity. Principal products: alkyl aryl sulfonates, alkyl sulfates, alkanolamides, petroleum sulfonates, ethoxylated sulfates, organic acids.

FOREIGN

Petrochemicals/Mexico: Within a month, the Mexican Congress is expected to act on a bill that would reserve a number of petrochemicals for production only by Petroleos Mexicanos (Pemex), the government-owned oil monopoly. Products on this list will include nine for which Pemex has plants under construction or projects on which construction is to begin later this year: acetone, ammonia, benzene, butadiene, ethylene, methanol, polyethylene, toluene and xylene. Other petrochemicals to be reserved for Pemex development: acetic acid and anhydride, acetylene, amyl and other alcohols, carbon bisulfide and tetrachloride, chloroform, cumene products such as isopropylbenzene, methylene chloride, nitroparaffins, propylene, and various polymers. The 13 projects for which financing has already been arranged represent a total initial investment of about $112 million.

•

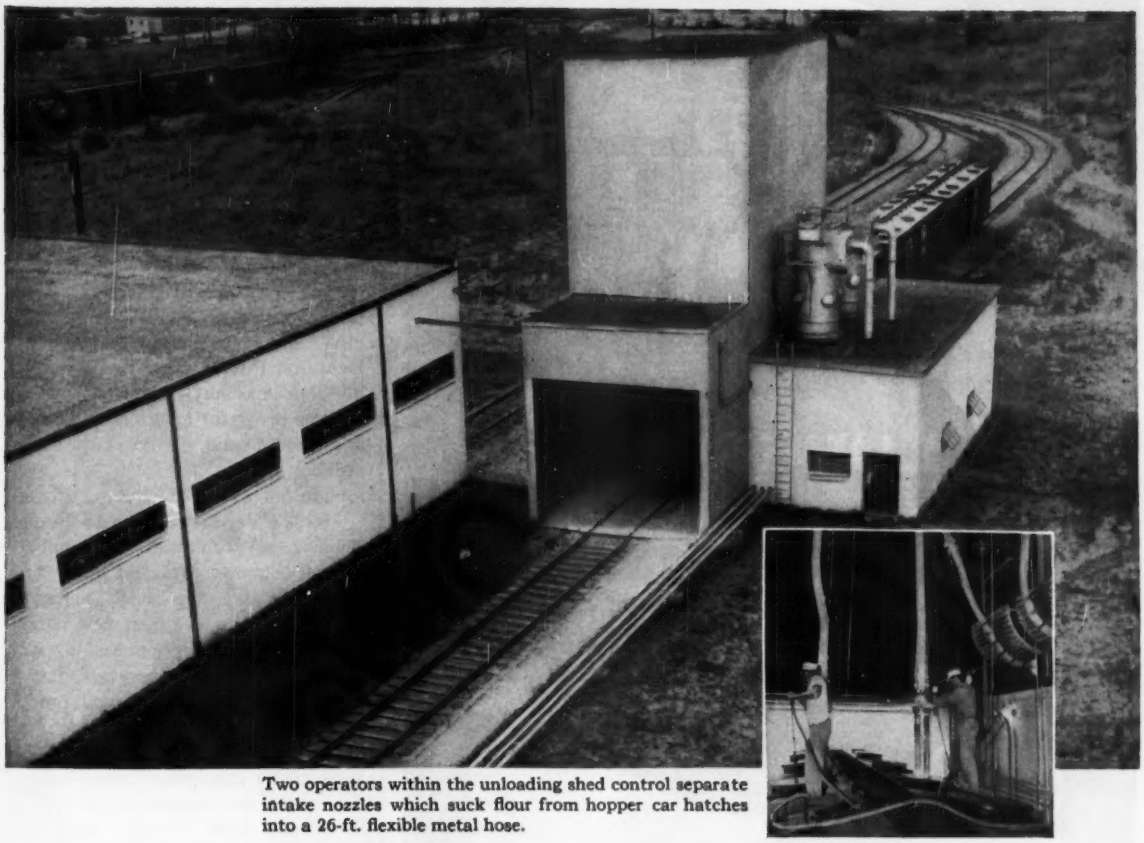
Plastics/Germany: West Germany's plastics industry increased its annual output fivefold from '50 to '57, according to an industry report. In '50, the ratio of plastics production in the U.S. to that in West Germany was more than 10 to 1; by '57, it was less than 3 to 1. Germany's plastics production: polymerization products, 554 million lbs.; condensation products, 466 million lbs.; cellulosics, 158 million lbs. From '50 to '58, West Germany's annual plastics imports rose from $2.2 million to $41 million, while exports of plastics mounted from $7 million to $130 million.

•

Carbon Black/Italy: Columbian Carbon Co. (New York) is the latest U.S. producer to launch a carbon black manufacturing project in the European "Common Market" area. Columbian says its $6-million plant—to be built near Milan, northern Italy, for completion by early '61—will be one of Europe's largest, with a 60-million-lbs./year capacity. The plant will be operated by Columbian Carbon Europa.

Company President Lyle Shepard says Columbian "is now studying other locations for world expansion."

The Arithmetic of Materials Handling



Two operators within the unloading shed control separate intake nozzles which suck flour from hopper car hatches into a 26-ft. flexible metal hose.

Flexibility of FULLER Pneumatic Conveying Systems Makes Problem Plant Site Practical For General Mills

The proposed site of a new General Mills flour blending and packaging plant in Louisville, Ky. seemed impractical to mill engineers because of the site's long, narrow shape. Flour, delivered at a dead-end rail siding, would have to be conveyed over unusually long distances—400 feet from unloading point to storage bins.

By incorporating Fuller Airveyor® pneumatic conveying systems in the plant design, General Mills has overcome these disadvantages and has completed one of the country's most modern bulk flour handling plants.

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For details on the Fuller product line, see Chemical Engineering Catalog.

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Thailand Trail-Blazer

Merck & Co. is making another addition to its rapidly growing overseas empire, this time as a charter member in the budding industrialization program of agrarian Thailand. Last week, the Rahway, N.J., pharmaceutical concern formed Merck Sharp & Dohme (Thailand), which will construct a $1-million plant near Bangkok.

The plant, Merck's 15th in 14 foreign countries, will go onstream early next year, employ 150 people in full operation. Products will be vitamins, diuretics, steroids, antibiotics, Decadron (Merck's latest antiarthritic hormone specialty) and the chlorothiazide drugs for high blood pressure and heart disease. Thailand's pharmaceutical market last year was $16 million, all imported.

Merck's decision to locate in the small Asian country of 22 million people, company President John Connor said, was prompted by Thailand's ambitious drive to attract new industry. Among the attractions: tax exemptions for up to five years, facilities for remitting capital and profits in foreign currencies, relaxation of immigration quotas to admit skilled technicians, exemption from import duties on initial equipment, reduction in import duties on raw materials, protection against competing imports and new competing industries.

At present there is virtually no manufacturing in Thailand; and to provide for orderly industrialization of the country, the government has established industry quotas. For example, only one other pharmaceutical concern (Danish) will be admitted.

Initial investment for the new subsidiary will total about $1.5 million, including $550,000 of working capital. Merck will invest directly $540,000, and the subsidiary will obtain the working capital through international lending institutions. Merck's Thailand distributor for 10 years, B.L.H. Trading Co., will provide $360,000 for fixed assets.

Of significance to chemical process management is the possibility that Thailand, coming into economic alignment with the West, might set a pattern for the industrialization programs of other small Southeast Asian countries. That would both open new markets for U.S. chemical exports and provide attractive areas for direct investments.

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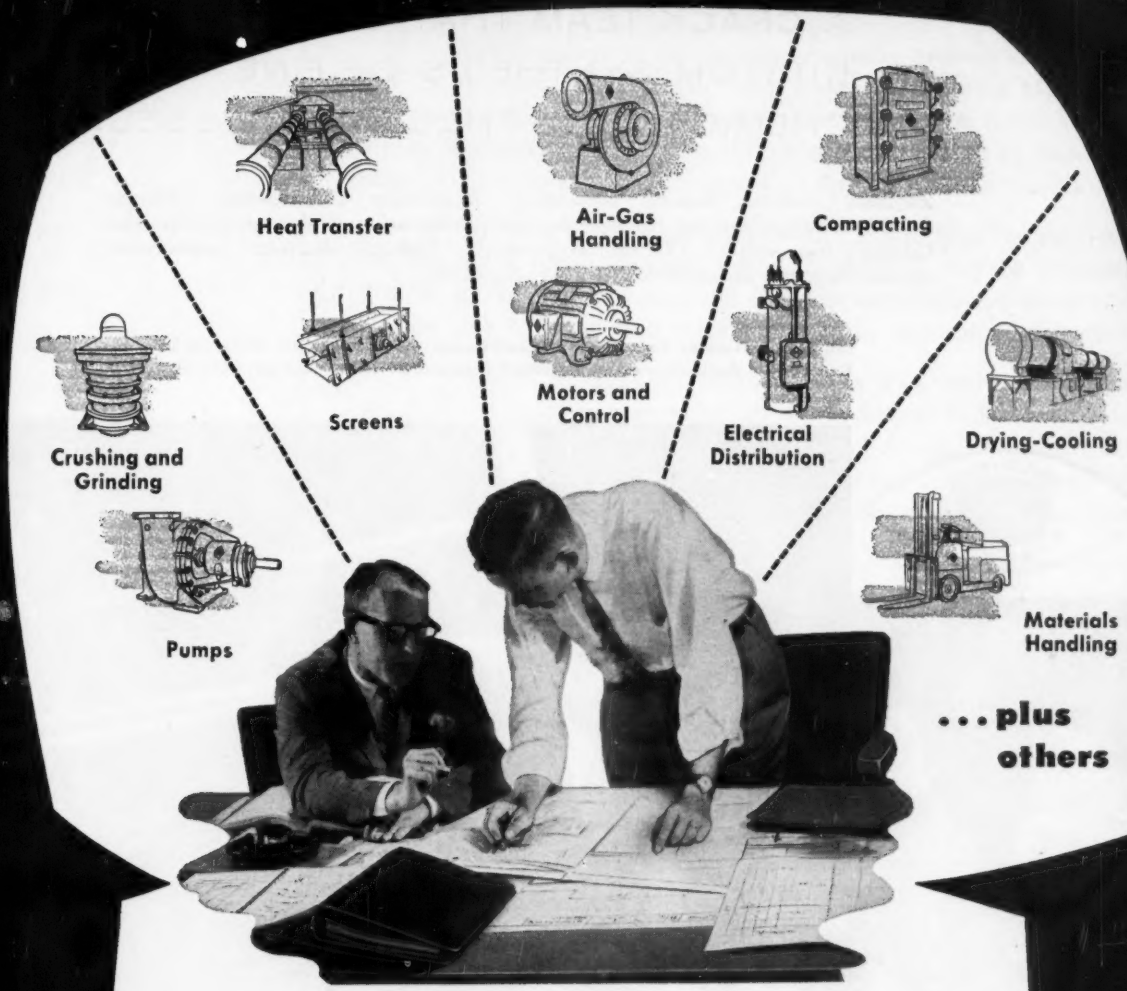

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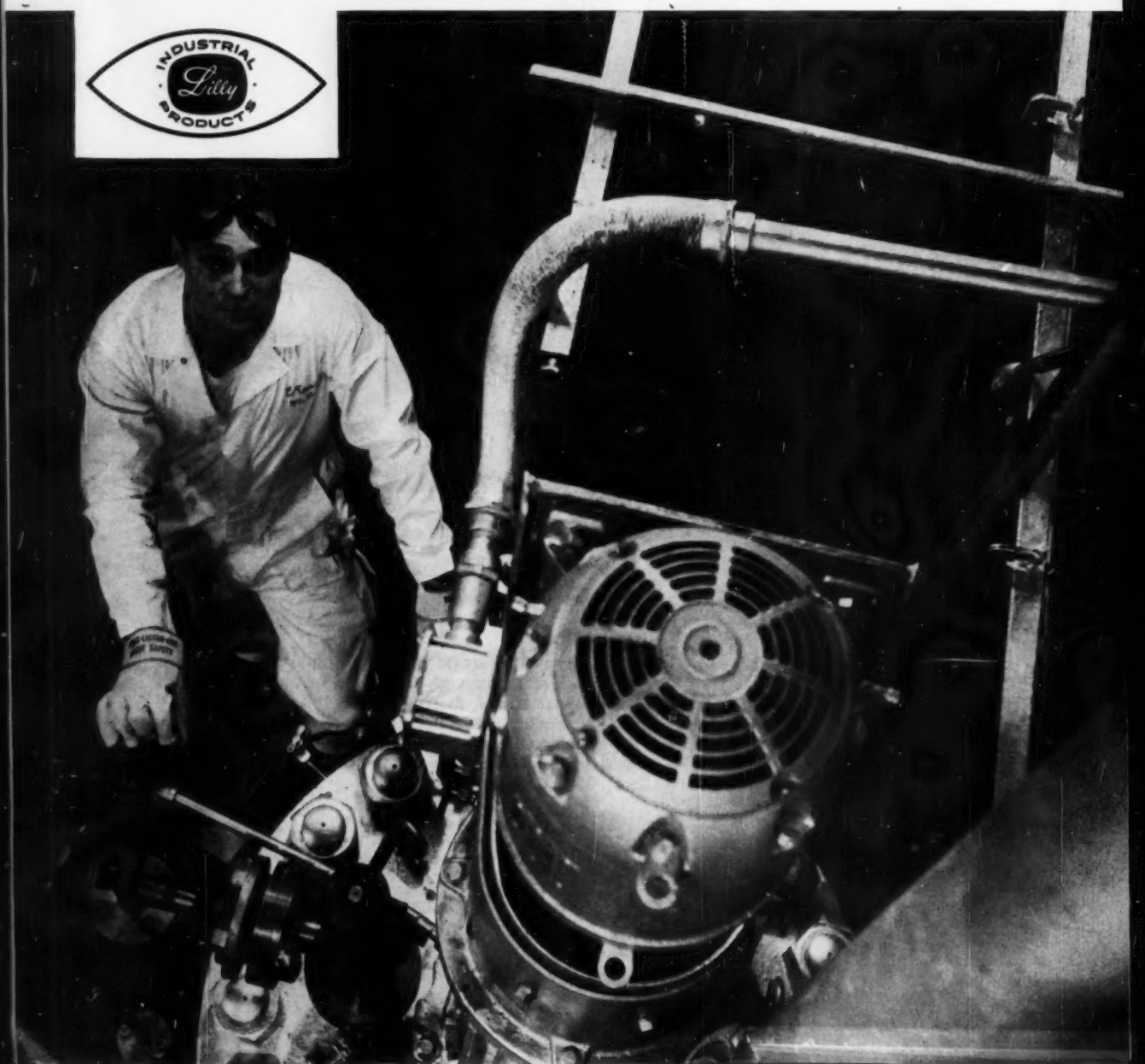

Washington
Newsletter

CHEMICAL WEEK
July 18, 1959

Tax incentives to spur private investment overseas are "imperative" in Manufacturing Chemists' Assn.'s view. That's what MCA's tax policy committee chairman, William A. Crichly, told the House Ways & Means Committee at hearings on H.R. 5, a bill introduced by Rep. Hale Boggs (D., La.) to give U.S. companies a variety of such tax benefits.

MCA is "in complete accord with the principles" of the Boggs bill, Crichly testified, "although minor clarifications may be required." Trouble is, the Administration and Congress have serious differences of opinion over how any such program should be legislated and handled.

The Commerce Dept. backs all of the major provisions: (1) deferral of U.S. taxes on income earned abroad until it is distributed back in this country, (2) a 14% lower tax rate for foreign trading corporations, (3) U.S. tax credits for taxes forgiven by foreign governments. The Treasury Dept. wants to limit deferral to so-called underdeveloped areas.

Boggs hopes to cite the increasing industry support for his measure as an argument for stronger White House backing. Then, in the next election-year session, he feels, the bill stands a good chance.

•

Legislation to aid Du Pont stockholders in the General Motors antitrust case faces a new roadblock. Influential tax authorities in Congress, including Sen. Harry Byrd (D., Va.), chairman of the Senate Finance Committee, want to postpone action until a court has actually ordered Du Pont to distribute its GM holdings to Du Pont stockholders. The Treasury Dept. this week told Congress it could safely wait for the final decision without risking the rights of stockholders—a move that strengthens the hand of those seeking postponement.

Sen. J. Allen Frear (D., Del.) and Rep. Richard Simpson (R., Pa.) are sponsoring identical bills to change the present law, which would require Du Pont stockholders to pay an income tax on the full market value of any GM stock they receive. The stock is valued at around $57/share. Under the Frear-Simpson legislation, the tax would be payable immediately on a valuation of only about $2/share, the price at which Du Pont originally acquired it. The full tax would become due only if Du Pont stockholders later sold their GM stock.

The House Ways & Means Committee will hold hearings on the proposal later this month. Chances of its adoption this session are not more than 50-50. The Justice Dept. favors some kind of Congressional action on the grounds that it would aid future antitrust actions.

•

Geographic price discrimination on sales of laundry bleach is charged by the Federal Trade Commission in a case filed against Thompson-Hayward Chemical Co. The Kansas City, Mo., firm manu-

factures and distributes about $24 million worth of industrial and agricultural chemicals yearly.

FTC charges Thompson-Hayward began selling its liquid bleach in the Dallas-Fort Worth area at 25¢/gal. shortly after opening its Dallas plant in '54. But, FTC says, the company maintained its prices of 40, 50 or 75¢/gal.—depending on quantity sold—on sales in the Kansas City area from its other bleach plant in Kansas City.

The sales at much lower prices in the Dallas-Fort Worth market area cost competing sellers a "serious loss of business," according to commission charges.

•

A price-fixing suit against Ciba Co., Inc., Geigy Chemical Corp., Sandoz Inc., and Toms River-Cincinnati Chemical Corp. ended last week with the signing of a consent decree by government antitrusters.

The consent decree bars the companies from fixing prices on dyestuffs manufactured in the U.S. Toms River is also barred from suggesting the price at which dyestuffs it makes shall be sold to third persons.

The Justice Dept. charged last May that the companies had set up a plan to stabilize and maintain prices at which Ciba, Geigy and Sandoz would resell the dyestuffs manufactured by and sold to them by Toms River.

All four companies are owned by three manufacturers located in Switzerland. Toms River manufactures dyestuffs exclusively for Ciba, Geigy and Sandoz, which buy about 60% of their requirements from Toms River.

•

The government will dispose of its uranium feed materials processing plant at St. Louis. The buildings and equipment, located on land leased from Mallinckrodt Chemical Works, have been on a stand-by basis during the past year.

Now the Atomic Energy Commission says production from other feed materials plants, where uranium concentrates are processed into useable forms, has made retention of the St. Louis facility unnecessary. AEC expects to save $250,000/year in maintenance costs by disposing of it.

•

A bill to provide uniform regulation of agricultural chemicals, passed by the House, will be taken up soon by the Senate. It is expected to go through this session. The bill extends the coverage on labeling and permitted tolerances of insecticides, fungicides and rodenticides to the newer group of plant regulators, defoliants, desiccants and nematocides. It means less cumbersome regulation for the manufacturer.

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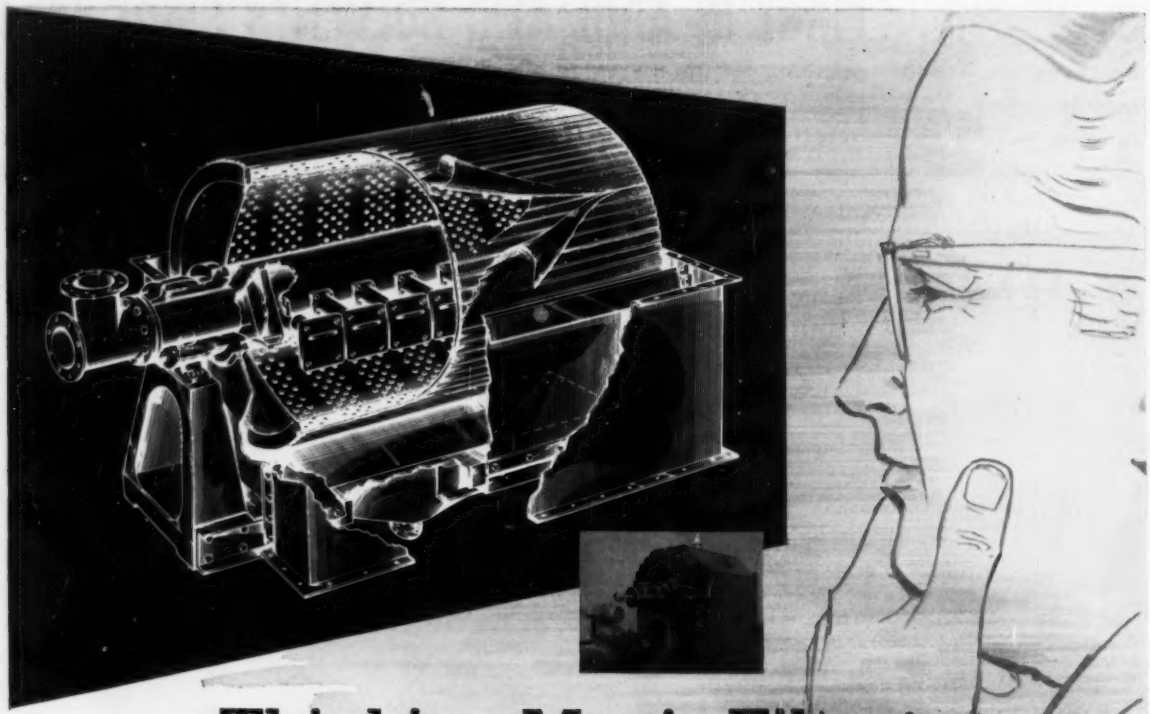

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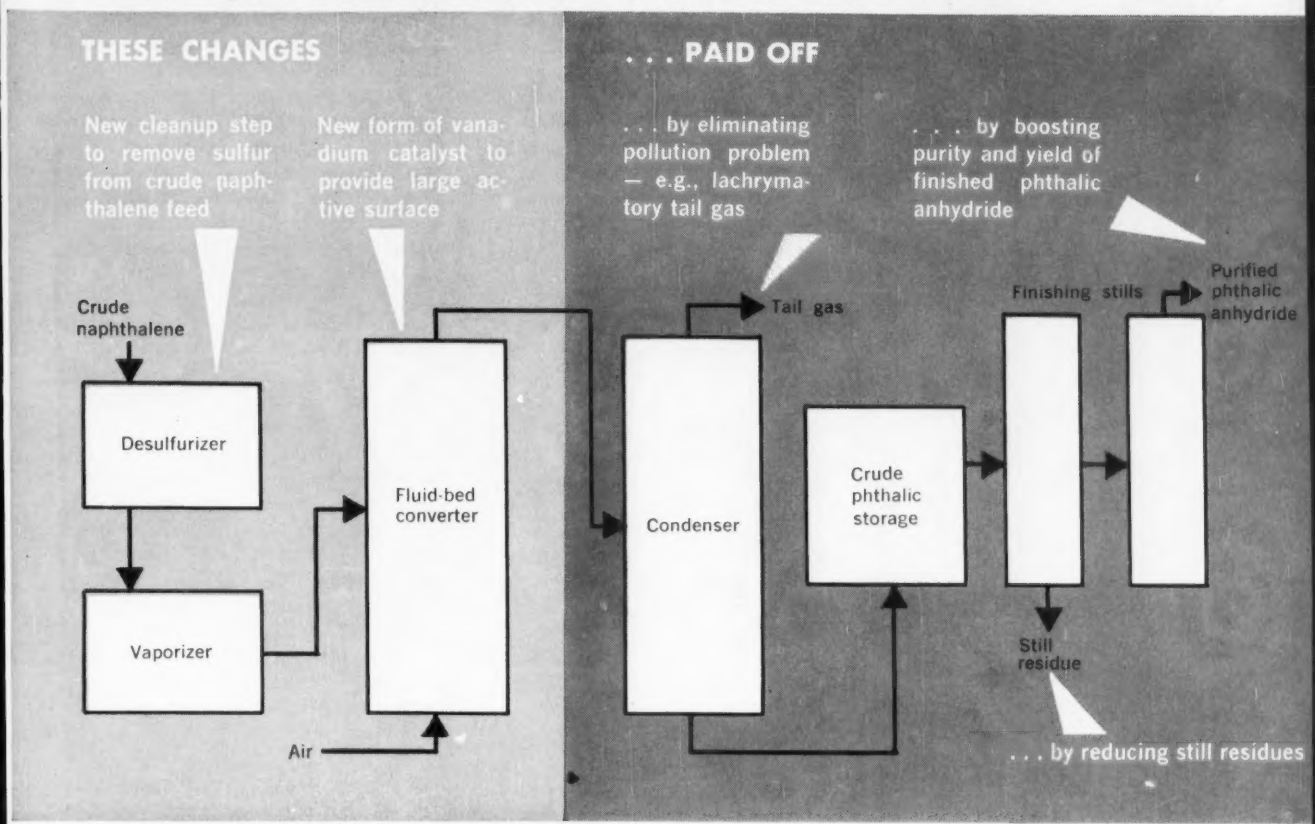
Phthalic production moves from fixed to fluid bed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Purified phthalic anhydride
Still residue
. . . by reducing still residues

Process Switch Breaks Phthalic Bottlenecks

After almost a year of full-scale operation of its fluidized phthalic anhydride process at Bridgeville, Pa., American Cyanamid is now taking some of the wraps off this process, which eliminates long-standing problems of fixed-bed phthalic processing.

Cyanamid, of course, is not the first to try fluidized processing here (Sherwin-Williams Co. is generally acceded that honor), nor the only manufacturer now operating a fluidized-bed unit. But the smooth development and scale-up of the Cyanamid process, and its clear advantages over the older, fixed-bed process—high output per dollar investment, improved product purity, elimination of pollution problems, and reduced labor requirements—are now easily shown.

Outgrown Bed: When it was first begun in this country commercially, phthalic anhydride production was limited to the fixed-bed process, which involves relatively high initial investment, time-consuming recatalyzation of several thousand fixed-bed converter tubes, and generally higher operating temperatures. But with the rapid growth of phthalic—from an annual use rate of 40 million lbs. 20 years ago to about 400 million lbs. today—several processors undertook projects in the early '40s to adapt phthalic to fluidized techniques (*CW Technology Newsletter, Feb. 11, '56*).

The switch from fixed-bed to fluid-bed operation wasn't easy. Phthalic producers were confronted with numerous operating kinks that couldn't be completely ironed out in pilot-scale equipment.

As early as '44, Sherwin-Williams Co. built a small fluid-bed phthalic unit, followed it with a larger, $1-million facility in '52. Like the others, S-W had its share of startup difficulties, revamped its fluidized process in '54. Badger Manufacturing Co. (Cambridge, Mass.) assisted with the process modification, developed a special feed purification step useful if naphthalene impurities must be removed prior to oxidation. Badger is currently working on two S-W licensed plants—one for a Montecatini subsidiary, Aziende Colori Nazionali Affini (Milan, Italy); the other, a 30-million-lbs./year installation, scheduled to start this fall at Reichhold Chemicals' Elizabeth, N.J., plant.

Cyanamid's investigation of fluid processing was also started in the '40s, when the company's management was faced with the decision of perfecting the fluidized technique or installing new large-size fixed-bed units. It elected to follow the fluid-bed route, set up a pilot plant at its Stamford,

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Conn., laboratories. Results of more than a year's pilot operation convinced Cyanamid that the potential advantages of the process warranted the construction of a full-scale plant at Bridgeville.

Calculated Risks: The pilot plant couldn't provide all the answers to operating problems, and Cyanamid took certain calculated risks by jumping from a 2-in. fluidized converter to a commercial unit rated conservatively at 18 million lbs./year. Among the problems that could be solved only in large-scale operation: development of a catalyst that would be both active and stable; the possibility that impurities in commercial-grade naphthalene might cause trouble; the effect of back-mixing and eddying of the naphthalene-air mixture, which would lead to poor control of contact time.

In full-scale operation, one potential trouble spot—process control—proved to be no problem. But Cyanamid did have to develop a new fluid-type vanadium catalyst and add a feed cleanup step to desulfurize its crude naphthalene supply. Here's how the new process functions.

First operation is the one-step removal of sulfur from the crude feed naphthalene. This is accomplished by contacting the feed with metallic sodium, to form sodium sulfide. The sulfur-free naphthalene is then vaporized and fed to the catalyst bed of the fluidized reactor. Preheated air is forced in through the bottom of the bed, passed through a regeneration zone before mixing with the naphthalene.

The 70-ft.-tall, 13-ft.-diameter reactor is designed with two zones separated by a baffle. The reaction zone is in the lower section, contains tubular heat exchanges to permit heating or cooling by circulating Dowtherm. The quench zone in the upper section of the reactor is also equipped with heat exchangers, which cool the product gases to below reaction temperature. Quenched gas leaves the reactor through stainless steel, powdered-metal filters that prevent catalyst from being carried out of the system.

One major difference between the old fixed-bed converters and the new fluidized reactor is in the volume of catalyst required. Fixed-beds used relatively small quantities of vanadium pentoxide catalyst, supported on a suitable carrier in tubes up to 2 in. in diameter. The fluidized reactor, on the other hand, uses several hundred times more catalyst of slightly different composition and much finer particle size (50-60 microns).

As a result of the extremely large active surface afforded by the fluidized bed, napthalene is oxidized at lower temperature than in fixed beds. This reduces formation of undesirable by-products (e.g., maleic anhydride) and, coupled with the inherently better heat transfer and distribution of fluid beds, permits precise temperature control—within 1 to 2 degrees centigrade throughout the bed. It also simplifies heat exchange by permitting the use of Dowtherm in place of the sodium nitrate-nitrite salt used for cooling the higher-temperature fixed-bed units.

From the converter, the quenched gas passes through a condenser, where it crystallizes in oil-cooled tubes. Different sets of tubes in the condenser are alternately cooled and heated—first to condense the phthalic, then to melt the product for discharge to storage. Products from the fixed-bed units were condensed in the same way, but yielded lachrymatory compounds that necessitated burning the uncondensed tail gas. Elimination of this pollution problem and tail gas combustion is directly attributable, Cyanamid feels, to the lower operating temperature of the fluidized process.

Higher Yield: Final steps in purifying the crude phthalic consist of heating the product to near its boiling point to destroy unwanted maleic anhydride and naphthaquinone by-products, followed by fractionation in a multiplate column. Breakdown products are removed from the heat treatment still as a heavy residue composed of about 60% tar, 40% phthalic anhydride. Still residue from the fluid-bed product runs lower, says Cyanamid, than the 4% obtained from fixed-bed phthalic. And typical product from the final stage now is 97-99.5% pure phthalic (mostly above 99%), compared with 94.5-96% in the fixed-bed product.

Cyanamid also rates the process high in terms of economic yields. Though the plant was originally designed to produce 18 million lbs./-year, modifications in heat-exchanger design and other accessories have en-

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abled it to turn out 35-40 million lbs. year. This more than doubling of capacity is yielding an unexpectedly high output per dollar investment. And by eliminating the tedious job of discharging and reloading several thousand fixed-bed converter tubes, the fluid-bed process has reduced the labor required for large-volume production.

At present, Cyanamid has no plans to install a second fluid-bed unit at Bridgeville. Instead, it's using existing fixed-bed equipment to handle demand peaks that exceed fluid-bed capacity. But the fluidized process is an odds-on favorite to win out over fixed-bed units for any substantial increases to present phthalic anhydride capacity.

AC Moves into Control

A radically new addition to conventional power control devices was introduced last week by Ovitron Corp. (Detroit). It's dubbed the Ovitron Electro-Ionic static control, is reportedly capable of switching and modulating almost any amount of alternating current continuously—with virtually no wear or deterioration.

Stanford Ovshinsky, inventor of the device and president of Ovitron, compares the operating principle of the new switching unit to that of a human nerve cell.

It consists of two load-connected electrodes, which are normally nonconducting, and a grid control element, all of which are immersed in an electrolytic solution in a permanently sealed container. The application of a small energy stimulus introduced through the grid control element instantaneously changes the semipermeable surfaces of the load electrodes to a conductive state, permitting high alternating current to flow between them through the electrolyte. It employs no moving parts, magnetic coils or other bulky, costly amplifying equipment.

Control Application: This novel concept in ac. power switching fills a big void in the control field, says Ovshinsky. The conventional switching devices—such as relays, whose moving parts are subject to wear, and magnetic amplifiers, which are bulky and very expensive for high-wattage applications—are outmoded for today's automatic control systems. The new unit, depending on electro-ionic surface impedance control, however, has no moving parts to wear out, can be expected to operate dependably for an indefinite period of time under normal conditions.

Cost of the electro-ionic cell is expected to be "more than competitive" on a volume production basis. The lack of moving parts simplifies construction, eliminates the need for close tolerances and critical adjustments.

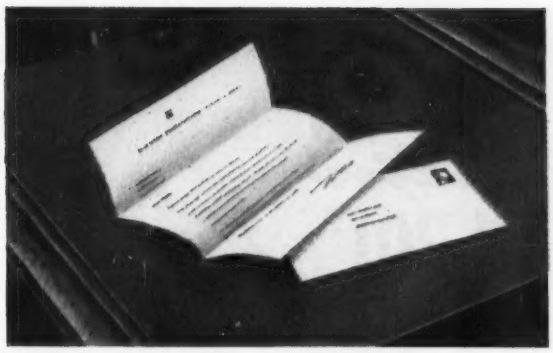
The company hasn't revealed the selling price of the new units, but Ovshinsky predicts they will be "more economical—per volt—than any competitive device."

The reliability and long service life of the device are built-in features of the chemical system employed in the cell, says Ovshinsky. The nonconductive surface of the load - carrying electrodes is tantalum oxide (other nonconductive materials can also be employed), which is a self-regenerative compound.

The electrolyte—described only as an acidic solution containing metal ions—is stable over a fairly wide range of operating temperatures (normally about −35 to +165 F), remains virtually unchanged. Small amounts of gas resulting from decomposition of the electrolyte by the flow of control-grid current are reconstituted by a catalyst to prevent depletion of the fluid. The catalyst, in turn, is protected against deterioration by a semipermeable membrane, which isolates it from the other components in the cell.

The chemistry of electro-ionic cells also provides a built-in safety feature, says Ovshinsky. With a maximum control-grid signal of two volts, the cell provides on-off control, or modulation proportional to the grid input, of 300 watts of ac. power. In the event of an overload, destruction of the semipermeable electrode surface causes the cell to stop functioning in a fail-safe (nonconducting) condition.

Power-switching capacity of the model now in limited production is 300 watts at 70 volts (max.). Higher power-handling requirements (higher voltages) can be met by connecting cells in series, says Ovshinsky, but it's also possible to design larger units to carry heavier loads. For the present, however, Ovitron is concentrating on a few selected uses for the new device, is choosing orders to



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prevent possible misapplication of the unit.

Laboratory models have been tested for industrial uses other than switching—e.g., logic devices, circuit breakers, error detectors, amplifiers and regulators. And by varying the composition of the electrolyte, says Ovshinsky, it's possible to build in dependable time-delay features.

Ovitron is currently putting in an electro-ionic control installation for an automotive company, says that units are available for sale. "But this is just the beginning," says Ovshinsky, "we haven't scratched the surface of potential applications."

PROCESSES

Rare-Gas Purification: American Metal Products Co. (Detroit) has a new catalytic method of purifying helium and argon. The catalyst, with an effective life of more than 1,000 hours, removes a wide variety of solid and gaseous impurities from the rare gases at an operating temperature of 1200 F. Nature of the catalyst was not disclosed, pending issue of patents. First commercial application of the new system will be made by M&C Nuclear Inc. (Attleboro, Mass.).

•

Maleic Anhydride: A group of Indian researchers at the Shri Ram Institute for Industrial Research (Delhi) recently described a set of optimum conditions for producing maleic anhydride from benzene by catalytic air oxidation. Maleic yields of 70-76% were said to have been obtained under the following conditions: 440-455 C; catalyst consisting of equal amounts of vanadium and molybdenum oxides with phosphorus pentoxide added; catalyst carrier of medium porosity; benzene-to-air ratio of 162:1 to 218:1 (by volume).

•

Glutamic Acid: Ajinomoto Co., Japan's largest producer of monosodium glutamate, has a German patent application (DAS 1,050,342) on a synthetic route for producing glutamic acid. Starting materials, acrylonitrile, carbon monoxide and hydrogen, react in the presence of cobalt carbonyl to form β-cyanopropionaldehyde. This product, in turn, reacts with hydrogen cyanide and ammonia to produce glutamic acid dinitrile, which can be converted into the acid.

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Aluminum Sulfate
Ammonia (dry)
Ammonium Bicarbonate
Ammonium Carbonate
Ammonium Nitrate (no free nitric acid)
Ammonium Sulfate (no free sulfuric acid)
Ammonium Sulfide
Ammonium Thiocyanate (pure)
Amyl Acetate
Aniline (liquid)
Aniline (vapors)
Animal Oils
Asphalt
Barium Chloride
Benzaldehyde
Benzene
Benzoic Acid
Benzol
Bituminous Compounds
Boric Acid
Butyl Acetate
Butylaldehyde
Butyric Acid
Calcium Sulfide
Carbolic Acid (phenol) (below 212°F)
Carbon Dioxide
Carbon Disulfide
Carbonic Acid (dilute)
Carbon Monoxide
Carbon Tetrachloride (dry)
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Chlorine (dry)
Chloromycetin
Chromic Nitrate
Citric Acid
Creosote
Cresol (below 212°F)
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Dipentene
Diphenyl Ether
Dyestuffs
Ethers
Ethyl Chloride (dry)
Ethylene
Ethylene Glycol
Ethyl Oxalate
Fats
Fatty Acids
Ferrous Ammonium Sulfate
Ferrous Sulfate
Formaldehyde
Freon 11, 113
Freon 12, 22, 112, 114
Furfural
Gas, Illuminating
Gases, Flue
Gasoline (anhydrous)
Gelatin
Gluconic Acid
Glucose
Glycerin (pure)
Glyceryl Phosphate
Hydrocyanic Acid
Hydrogen
Hydrogen Peroxide (30% and higher)
Hydrogen Peroxide (dilute)
Hydrogen Sulfide
Isobutane
Kerosene
Lacquers
Lactic Acid
Latex
Lead Arsenate
Lignite Wax
Lime
Linseed Oil
Liquid Fuels
Lubricating Oils
Maleic Acid
Methylamine
Methyl Cyclohexamine
Methyl Formate
Methyl Salicylate
Mineral Oils
Monoethanolamine
Nephtha
Naphthalene
Naphthol
Naphthenic Acids (up to 180°F)
Nitric Acid (above 80%)
Nitrocellulose
Nitrogen
Nitrogen Peroxide (dry)
Nitroglycerine
Nitrous Acid
Nitrous Oxide (dry)
Oleic Acid
Organic Amines
Oxalic Acid
Oxygen
Ozone (wet)
Paints
Palmitic Acid
Paraldehyde
Peanut Oil
Phenol (up to 212°F)
Phosphorus (dry)
Phosphorus Pentoxide (dry)
Phthalic Acid (pure)
Picric Acid
Pinene
Pine Oil
Plastics
Potassium Bromide
Potassium Chlorate
Potassium Chloride
Potassium Dichromate
Potassium Ferricyanide
Potassium Nitrate
Potassium Permanganate
Potassium Sulfate
Propionic Acid
Propylene Glycol
Pyridine
Resins
Resorcinol
Rubber
Salicylic Acid
Sewage
Shellac
Sodium Acetate
Sodium Bicarbonate (dry)
Sodium Borate
Sodium Chlorate
Sodium Chloride
Sodium Chromate
Sodium Nitrate
Sodium Oxalate
Sodium Sulfate
Sodium Sulfocyanide
Sodium Thiosulfate
Steam, Low Pressure
Stearic Acid
Streptomycin
Succinic Acid
Sulfur Dioxide (dry)
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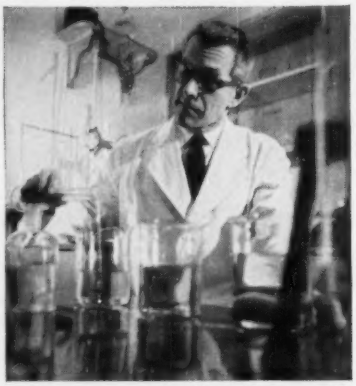
Progress Report... Pentanedione

New chelates with 2,4-pentanedione

Metal chelates provide a means of deactivating or modifying the properties of a metal ion. Effective chelating agents with many industrial applications can be formed by the reaction of CARBIDE's 2,4-pentanedione (acetylacetone) with numerous metals and oxides.

Pentanedione, or acetyl acetone, usually forms oil-soluble metal derivatives, whereas most other chelates are water-soluble. Certain of these chelates may have possibilities as fungicides, insecticides, driers for paints and varnishes, and colors for inks. Titanium pentanedionate is indicated as an excellent cross-linking agent for cellulose-derivative films and coatings giving them high solvent resistance.



Here are some other ideas . . . By adding a small amount of 2,4-pentanedione to a water solution of a coating-metal salt, hard and bright films can be laid on baser metals without an electric current. The discoloration of cyclic carbonate spinning solutions of acrylonitrile polymers can be inhibited by adding 0.1 to 3.0 per cent 2,4-pentanedione to the solution. Butadiene may be copolymerized with 2,4-pentanedione to produce an improved grade of synthetic rubber, suitable for industrial uses. A granular, water-insoluble, anion-active resin can be made with 2,4-pentanedione as the reactive ketone. The soluble metal derivatives of 2,4-pentanedione should be evaluated for their ability to increase the efficiency of internal combustion engines when added to lubricating oils.

Remember, CARBIDE's 2,4-pentanedione is fully miscible with most organic solvents. Its molecular weight of 100.1 also makes it interesting as an intermediate. For more information a technical bulletin containing many suggestions for applications of CARBIDE's 2,4-pentanedione is available. In it are listed physical properties, specifications and shipping information. For information on other CARBIDE chemicals, write for the 1959 Physical Properties of Synthetic Organic Chemicals—a comprehensive description of the properties and applications of more than 400 CARBIDE chemicals. Please write to Dept. HW, Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

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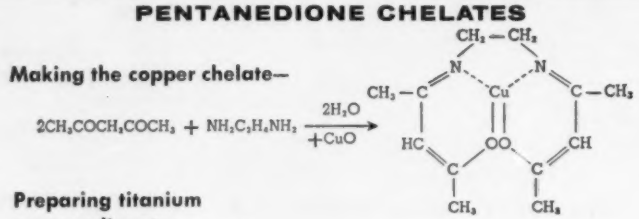
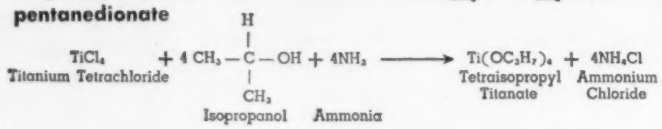
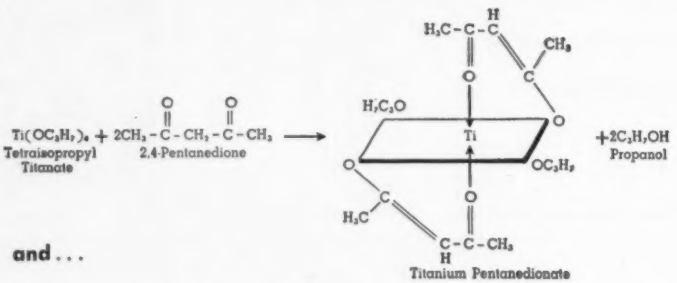
PENTANEDIONE CHELATES

Making the copper chelate—



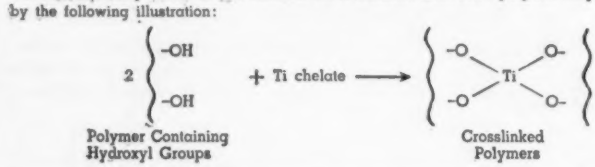
Preparing titanium pentanedionate





and . . .

The crosslinking effects of this material on a cellulose derivative polymer may be shown by the following illustration:



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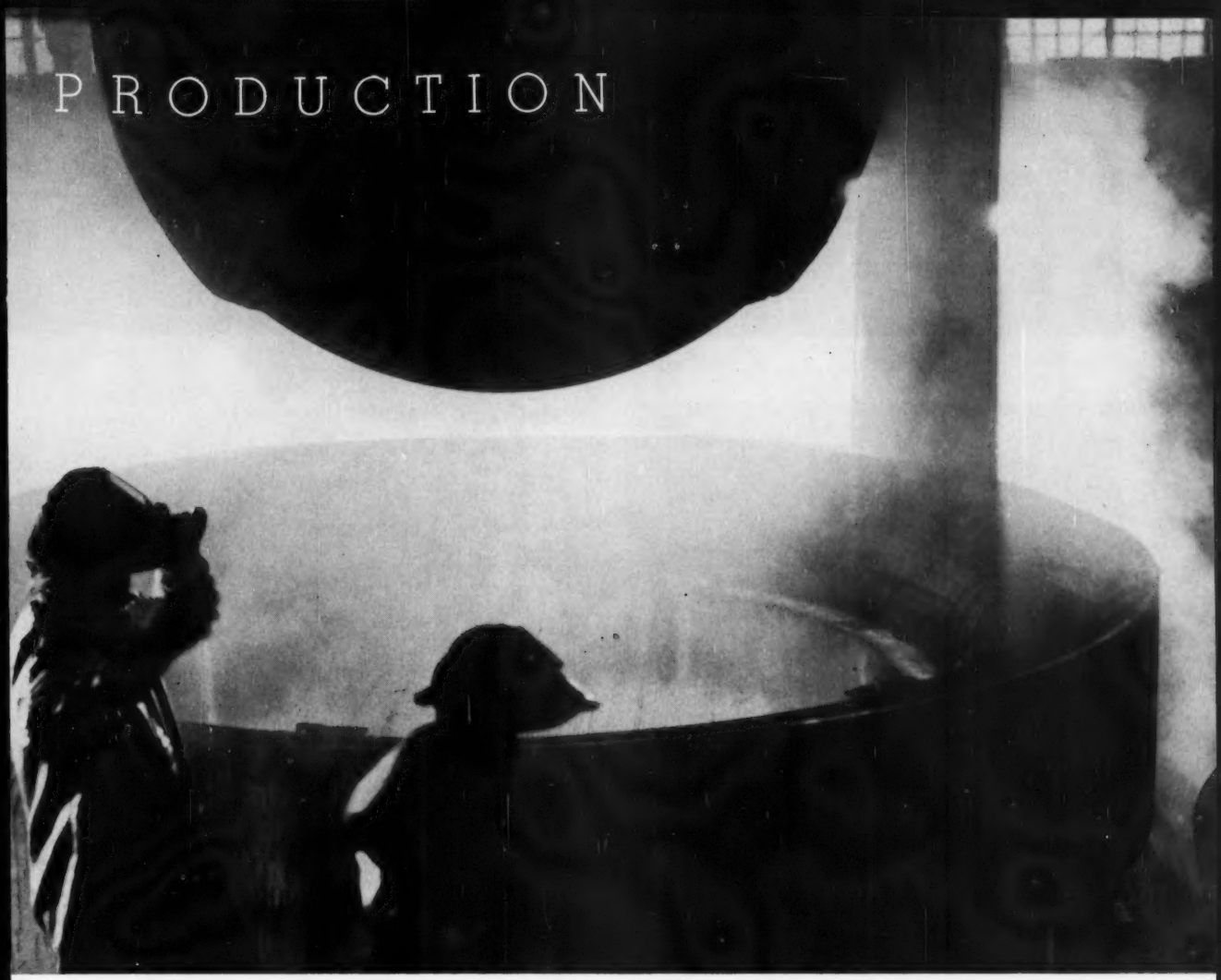


One 3,300-ton press stroke forms 29-ton reactor bottom closure at Babcock & Wilcox plant.

New Pressure Backs Big-Equipment Needs

To the chemical industry, the die-forming of a reactor's 29-ton bottom closure in a single stroke (pictured above at Babcock & Wilcox's Barberton, O. plant) is a fulfillment of its need for larger process equipment. And this week there is growing evidence that the difficulties of fabricating such equipment are under new attack from many sides.

Note these new fabrication facilities:

• A. O. Smith is completing a $2-million plant expansion at Milwaukee for fabricating heavy plate into process equipment. These facilities include turning rolls for rotating vessels of up to 250 tons during welding and fabrication, and two cranes with lifting capacities of 150 tons.

• Chicago Bridge & Iron is beginning the final stage of a $1-million expansion at Houston that will add fabricating and pickling facilities for large storage vessels and process equipment.

• Griscom-Russell has put in new facilities, including a 75-ton crane, for fabricating heat transfer equipment.

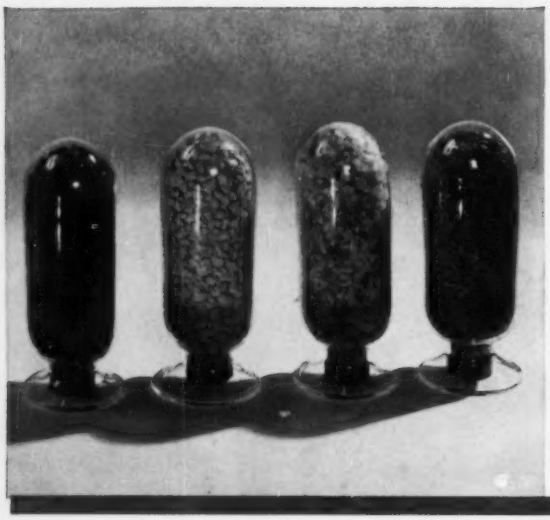
These, and many other enlarged plants, point up the fabricators' efforts to keep up with the big equipment trend. Says H. F. Detrick, vice-president of A. O. Smith's Process Equipment Division: "Today's requirements by industry call for vessels having wall thicknesses of 6-10 in., diameters of 10-12 ft. and weights up to 200 tons. And we see even bigger sizes in the future."

The most pressing demands for big, heavy equipment are coming from the nuclear power industry, according to some fabricators. But one declares that the nuclear business is mainly in the future—right now, it is only a "glamorous excuse" for getting approval for the facilities from the board of directors. The bread and butter, says this source, is in the chemical, petroleum and steam power fields.

And there's no question that petroleum refiners—and some chemical companies—are trending to larger equipment that offers operating economies. Also, higher temperatures and pressures are becoming more popular in processing. Chemical Construction's Srini Vasan points to the increasing demand for urea plants, whose 100-atmosphere pressures are not uncom-

news briefs...

ON THE CREATIVE USE OF M&C PROCESS MATERIALS



Goodyear's Pliolite S-5 synthetic rubber resin granules for use in masonry paints.

*Paint resin manufacturer saves on costs, maintains quality, with ASP® extender pigment

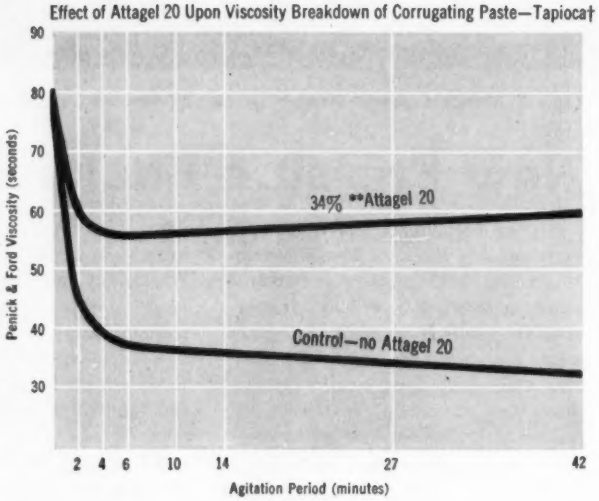
The Goodyear Tire & Rubber Company puts M & C's ASP 100 in Pliolite S-5 synthetic rubber resin for masonry paints . . . achieves reduction in raw materials costs while keeping up physical properties and chemical resistance. A bonus comes from improved abrasion resistance in the paint product.

In surface coatings, manufacturers and users alike are learning the benefits of lower costs *plus* boosted performance from the family of ASP aluminum silicate pigments—water-washed and produced in five grades by particle size and in seven other grades surface-modified for specific performance characteristics. This is a *starred* item . . . use the coupon.

*Corrugated Board Makers: get superior viscosity stabilization of starch adhesives with new Attagel® 20

Graph shows how addition of Attagel 20 to a tapioca starch formulation holds viscosity at a *higher, more stable* level. *Reason:* Attagel 20, a colloidal grade of processed attapulgite, forms stable gels on application of shear—this gelling action tends to balance the thinning out of the corrugating paste with shear. Several plants are already using Attagel 20 in their corrugating starch adhesives. *Results:* greatly improved viscosity stability and also greater adhesive mileage. What about your plant? This is a *starred* item . . . coupon brings the latest data.

†In this laboratory evaluation, high shear equipment was employed to accelerate viscosity breakdown—also, amount of Attagel 20 added not indicative of commercial applications. Quantity of Attagel 20 for optimum results depends on individual plant conditions.



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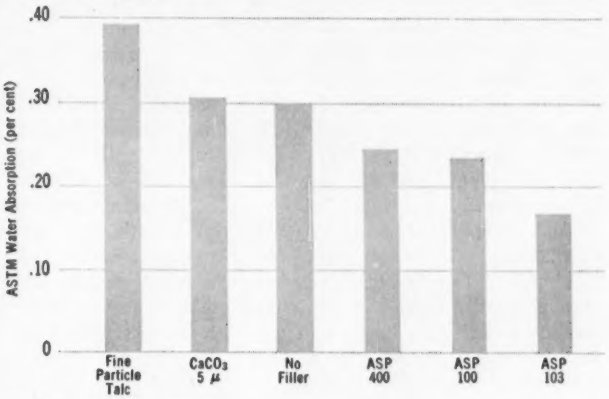

Test Method: ASTM D570-42
Filler Loading: 35 per cent by weight of resin-filler mix
Resin: General purpose polyester resin
Reinforcement: 32 per cent by volume treated glass mat
Cure: 3 minutes at 250° F. Post cure 8 hours at 200° F.
Catalyst: 2 per cent benzoyl peroxide paste (50 per cent active)

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mon (although temperatures are not high). Melamine processes require even higher pressures. Oxo chemical processes often operate at about 100 atmospheres and 300 C. And, there is much interest in using anhydrous liquid ammonia, which will require high-pressure operation.

Wrong Direction? But even fabricators show concern over the turn the bigness trend is taking. "Big, heavy steel plate isn't the real answer. You have problems in moving it around the plant while fabricating it, in shipping it to the erection site, and in putting it together at the equipment purchaser's plant," says Phil Otten of Griscom-Russell.

"And, you never know exactly what stresses will be set up within thick plate. The ultimate solution must come from improvements in metallurgy that will allow us to use thinner materials," Otten adds.

Arthur Lytle, research vice-president of Union Carbide Metals, agrees that thicker plate isn't the answer. "Thickness creates more problems than it solves," he says.

Lytle points out that thicker steels are intrinsically poorer in quality, that metal over 2 in. thick hasn't been worked sufficiently. But he doesn't agree that all the improvements are to be found in metallurgy.

"We have the metals to do many of the jobs," Lytle says. "But people have to be willing to pay the price." The price isn't entirely one of cost, however.

Lytle mentions stainless steels and Hastelloy C as higher-cost answers to some problems. But he feels the more exotic metals are only solutions in special cases. There are many high-strength steels in the intermediate cost range between ordinary carbon steel and stainless. "Ordinary iron is a lot better than we give it credit for," he says.

Welding Problems: Lytle admits that while many of these steels have strength, weldability limits their use to alloys with 0.25% carbon. Many special steels are difficult to weld. Lytle cites armor plate, for example, as having all the needed strength properties. "But you just can't joint it because it hardens too quickly," he says. Heated for welding, it's transformed into Martensite, becomes very brittle.

And, while alloys are developed with an eye toward weldability, and welding techniques are continually being improved, many problems remain to be solved. Thick plate adds to the problems, particularly in the field. Low-carbon steel (0.15-0.30% carbon) is readily welded, provided the thickness is not greater than about ½ in. Extra caution is needed for thicker sections, although the dividing line isn't sharp.

For example, 2- to 3-in.-thick plate can be welded in one pass, but a lot of heat is generated and there is considerable shrinkage. The answer is multiple-pass welding. Usual practice calls for 10 or even 30-40 passes per inch of thickness.

Mounting Pressure: Materials to solve both temperature and pressure problems aren't easily found. "Fortunately, people would rather work with pressure than temperature," says Lytle. But, again, thick plate isn't the solution.

"Thickness has been resorted to because there has been a lot of inertia. Originally, pressure vessels blew up because people just didn't know—so they made them heavier," says Lytle.

He points to design improvements that resulted in elliptical heads that could withstand almost twice the stress of earlier designs.

Edward Wenk, Jr., chairman of the engineering mechanics department at Southwest Research Institute (San Antonio), explains today's problems this way: "In many cases refinement in design is unnecessary . . . and the cost unjustified. But where improvement is needed, it has not always evolved spontaneously. It usually takes a thorn in our side to make progress; and one of the primary thorns today is the weight, cost and difficulty of fabrication of heavy-walled nuclear reactor vessels, and of chemical and process vessels where operating requirements exceed limits of conventional experience."

The ASME Boiler Code permits continuous re-evaluation and revision, has set the stage for today's research by the Pressure Vessel Research Committee of the Welding Research Council. For example, Ecole Polytechnique of Montreal has been testing vessels under high-pressure static and fatigue loading at normal, low and high temperatures (e.g., 900 F at 22,000 psi.). The work may enable designers to take data directly from creep tables in coming up with a pressure vessel design.

At Southwest Research Institute, PVRC studies of the plastic fatigue of steels are under way. One of the questions: Is there any harm in having plastic deformation in pressure vessels? Some designs promote deformation, set up stress.

In the Other Direction: There are indications that many new chemical process industries requirements won't create thorns in the side.

To meet the higher-octane demands Esso Research and Engineering Co. has come up with an isomerization process that operates at 80-120 F. Pressures haven't been revealed, but are said to be low. The reaction is liquid-phase, results in almost 100% yield. This compares to Esso's present Powerforming process with reactor inlet temperatures of 900-1000 F and pressures of 300-450 psi.

But Esso's new low-temperature and pressure approach to high-octane gasoline processing isn't likely to reverse the trend toward large, heavy-plate equipment. And, there is little doubt that the multipronged attack on heavy equipment problems is coming at a time when it is needed most.

EQUIPMENT

Temperature, Pressure Regulators: Three manufacturers are out with new regulators for controlling temperature or pressure.

• OPW-Jordan (6013 Wiehe Rd., Cincinnati 13) has a combination unit for regulating both variables. Offered in 2½- and 3-in. sizes, the combined unit controls temperatures from 35-450 F. pressures to 250 psi.

• Kemp Aero Products (West Milford, N.J.) is offering a new pressure regulator, called Series HC-7300. Operating pressure range is 0-3,000 psi. at temperatures from —65 to 275 F. and a rated flow capacity of 10 gpm.

• Two new sensitive pressure-vacuum controls are now offered by United Electric Controls Co. (Watertown, Mass.). Models available are designated Type J27 (uncalibrated) and Type H27 (calibrated). The units are suitable for operation at temperatures up to 180 F.

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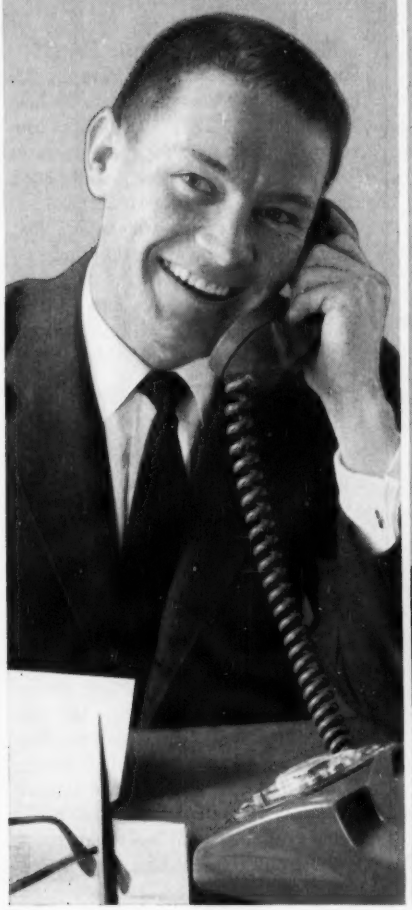

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Inc. (345 Harris Ave., Providence 1) has a new plunger-type proportioning pump for the accurate feeding of small amounts of chemicals. The new Model 1107 Adjust-O-Feeder provides feed rates of 0.2-2 gph., is designed for adding boiler treatment chemicals to make-up water as well as for general metering applications.

•

Motors: Hoover Electric Co. (2100 South Stoner Ave., Los Angeles 25) has added two new motors to its line. The Model D-2370 dc. motor provides 3.8 hp. at 7,200 rpm., features light weight (14.4 lbs.) and 80% efficiency at 3.8 hp. Model D-2260 400-cycle ac. motor weighs 6.2 lbs., provides 0.38 hp. at 1,500 rpm.

•

Demineralizers: Two new demineralizer systems that feature mixed-bed demineralizers (*CW, May 23, p. 76*) are being offered by Barnstead Still and Sterilizer Co. (135 Lanesville Terrace, Boston 31) and The Permutit Co. (50 West 44th St., New York 36), division of Pfaudler Permutit Inc.

• Barnstead's new system produces water of 18-million-ohm purity for use in the chemical, electronic and nuclear fields. The system has sand and carbon filters for preliminary treatment, a four-bed demineralizer for removing most ionizable impurities, two high-purity stills for removing non-ionizable, suspended and gaseous impurities, an intermediate storage tank and a mixed-bed demineralizer for removal of trace impurities. The system's final units are a submicron filter and water heater.

• Permutit's new unit is a mixed-bed demineralizer for laboratory use that connects directly to a water supply tap. Called MED-6A, the unit has a 6-in. tank; capacity: about 1,500 grains total solids as calcium carbonate.

•

V-Belt: Goodyear Tire & Rubber Co. (Morrill Ave. & 56th St., Lincoln, Neb.) has an improved version of its E. C. Cord Green Seal V-belt, with a 40% increase in horsepower ratings. The firm offers compass-cord belts in lengths up to 120 in.; multiple-ply belts in greater lengths.

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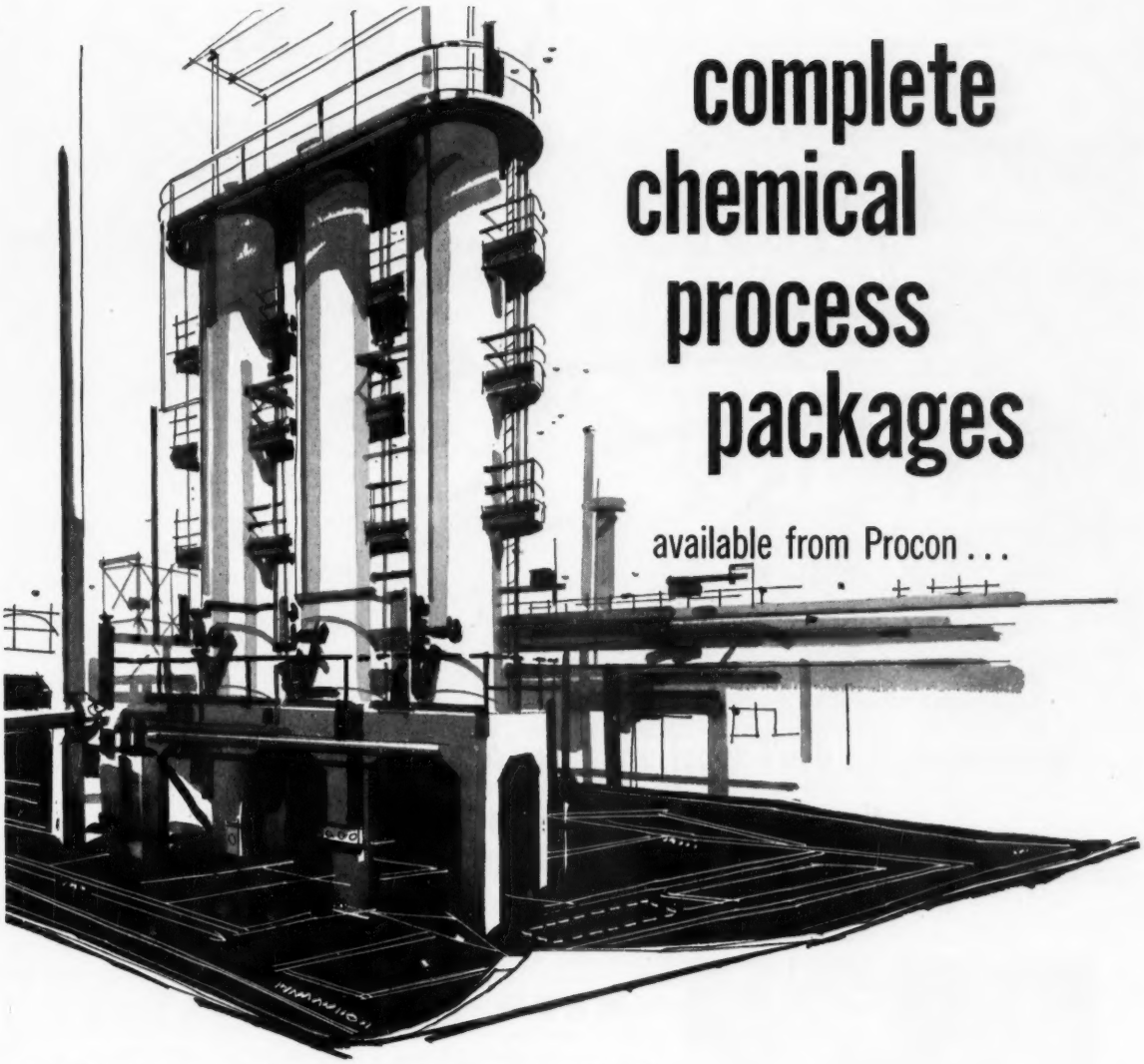
Custom-Made Gloves: The Pioneer Rubber Co. (296 Tiffin Road, Willard, O.) has a custom glove service for workers with unusual fitting problems.



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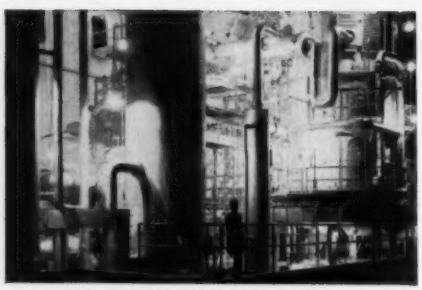

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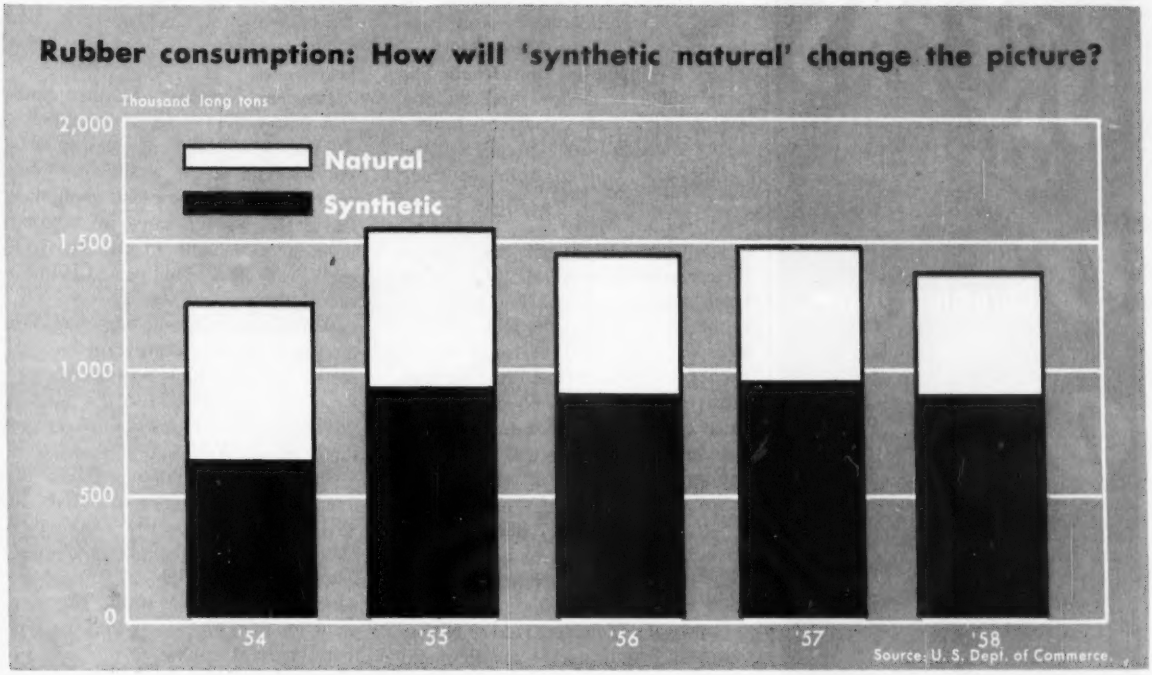

'Synthetic Naturals' Come Off the Sidelines

This week, the commercialization of "synthetic natural" rubber is shifting into the final stages. Two large oil companies and a major tire manufacturer are moving ahead with plans for the construction of commercial-size polyisoprene and cis-polybutadiene plants.

Shell, a leader in dropping the price of polyisoprene, is starting construction of its new polyisoprene plant at Torrance, Calif. (*CW Technology Newsletter, July 4.*) This is also the site of the company's pilot plant for the synthetic natural rubber. C. F. Braun will handle the construction details for the new plant, which has an expected capacity of 20,000 long tons/year.

Small quantities of Shell's material, tabbed Shell Isoprene Rubber, are now being used by U. S. Rubber in the manufacture of truck tires (*CW, March 21, '59, p. 23*). Material for this production is currently being supplied by Shell's pilot plant, which is turning out about 5 tons/day.

Meanwhile, *CW* learned this week, Phillips is also rushing completion of designs for a 20,000-long-tons/year plant at Borger, Tex., site of its synthetic rubber center. Phillips will make the *cis*-polybutadiene type of natural rubber, and is offering it under the tradename Cis-4. Currently, the company is selling material from its pilot-plant operations, which are capable of producing over 100,000 lbs./month.

A check with Firestone reveals that it, too, is finishing up engineering studies for a synthetic natural rubber plant at Orange, Tex. Actual construction work is expected to get under way within the next month or so: clearing of the site has already begun. Design capacity for the new unit will be about 30,000 long tons/year, but trade sources figure the initial production rate will be about half this amount.

Unlike the other two facilities mentioned above, the Orange unit will be capable of producing both types of synthetic natural rubber, Coral (polyisoprene), and Diene (*cis*-polybutadiene). Firestone is now making both these products on a pilot-plant scale and is using all its own output for evaluation studies.

Goodyear, which had also revealed intentions of building a plant, reports it has no formal plans for a commercial unit. The company is, however, continuing its pilot studies on Natsyn (polyisoprene).

With both types of the synthetic natural rubber going into commercial production, the next big question that will be studied by the rubber industry is, Which of the two products has the best future? Reason: polyisoprene is a good substitute for natural rubber, and makes a product with properties closely resembling those of the tree-grown variety. However, the *cis*-polybutadiene, when added to the natural rubber, imparts superior properties to it that cannot be obtained in either the natural or synthetic rubber. Thus, the industry is still uncertain about which of the two products will prove the most valuable material.

Tire Makers' Decision: In the case of Firestone, *cis*-polybutadiene will get the nod, although the polyisoprene

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will be produced later, if demand develops, Firestone officials say.

At present, apparently the only big outlet for polyisoprene and *cis*-polybutadiene is in the truck-tire field. Major advantage of the synthetic natural rubber is its low heat buildup, when trucks are operating under heavy loads and high speeds. Because of the heat buildup problem, truck tires are now being manufactured from natural rubber.

Unquestionably, truck tires offer a large market. In '58, nearly 13 million truck and bus tires were produced in the U. S. Because the most popular sizes of tires each use 15-25 lbs. of rubber, it's apparent that this one market could take nearly all the planned capacity for synthetic natural rubber.

In passenger tires, heat buildup is not as great a problem, and the superior performance of synthetic rubber (longer tread life) plus its lower price makes it appear to be a market that will stay in the domain of the older synthetics.

Land of Promise: Other outlets that look promising for the synthetic naturals are those products that require a uniform grade of rubber, with a good color, and very few impurities—requirements these new materials meet.

Price, however, will still be the major factor in the success of these new rubbers, since, of course, they will be competing with imported natural rubber, which is subject to constant price fluctuations. One of the advantages of the synthetic is stable price, which will encourage buyers to make purchases well in advance of needs; they won't be as concerned with fluctuations as is the case with natural rubber prices.

At present, natural rubber is selling at near 33-34¢/lb., while polyisoprene is selling for 30¢/lb. Tab on *cis*-polybutadiene is 35¢/lb., with the probability that it will be in the 30¢/lb. category when manufactured on a larger scale.

But consider this example of the constant changes in rubber prices: in the early part of '58, quotes were around 25¢/lb. With a firmer tone to the market, prices have steadily risen, with the high point for '59 reading 37¢/lb. During periods of low prices, synthetic would have a tough time competing with natural.

However, with the increased worldwide demand for all types of rubber, natural prices should stay up. And, chances are that both of the new synthetic natural rubbers will find ready acceptance during the next five years.

Isoprene Squeeze? Another problem that will play an important part in the long-range development of polyisoprene is the availability of a ready source of isoprene monomer. Currently, the quantity of isoprene monomer available in the U. S. is small, with Shell, Phillips and Humble the three big producers.

Shell, of course, will supply its own monomer. Its whole program for synthetic natural rubber production—from the raw material to the finished product—will involve a tie-in of three of its West Coast plants.

Shell Oil's Wilmington, Calif., refinery will supply raw materials to Shell Chemical's nearby Dominguez plant. The Dominguez plant will manufacture the isoprene monomer, which will be shipped to the Torrance plant for final processing into the synthetic natural rubber.

No doubt a large part of the output from the Torrance plant will be consumed by U.S. Rubber. At present, the company is using polyisoprene at its Los Angeles plant. But the rubber company reports it will not be the only outlet for the Shell product, which means that Shell will be forced to seek other rubber consumers.

Phillips can also draw upon its own isoprene supplies, but Firestone—and any other prospects—will have to get what they can from the three firms mentioned. There is, however, no shortage now.

In the case of the *cis*-polybutadiene, ample supplies of the butadiene monomer are available to take care of existing requirements of the new synthetic natural rubber producers. And in the case of Phillips, the company is already a large producer of butadiene.

Although the new synthetic natural rubbers will have a tough road ahead in gaining markets, there is a good possibility that these products will play an important part in the U. S.—and world—rubber picture. Key to their success may well be a continued worldwide demand for natural rubber, which would keep prices at a level that would turn U. S. buyers to the synthetic natural rubber.

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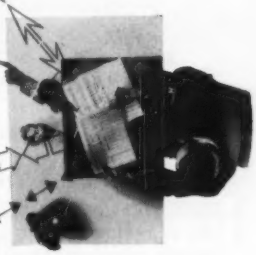

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Plastic Syndet Pack

A new outlet for high-density polyethylene—as liquid detergent containers—now looks like a good bet. Three of the top soap manufacturers are now test marketing the containers in various cities. Here's the rundown.

Armour & Co. is using its liquid chiffon to test the all-plastic container. The company is now distributing all three sizes in the Chicago, Milwaukee and Wilkes-Barre areas. Armour, one of the newcomers in the testing program, started distribution early last month.

Lever Brothers is now working in four marketing areas, Providence, Scranton - Wilkes - Barre, Milwaukee and Cleveland. The company is marketing with Swan, a new light-duty liquid detergent.

Procter & Gamble is also offering two of its products in the poly package, Ivory Liquid and Joy. Although the company would not name its test marketing area, trade sources peg Chicago and Milwaukee as two probable choices.

The potential market for high-density polyethylene here is large. Consumption of liquid detergents is running about 390 million lbs./year.

And since most containers hold less than 1 lb. of the material, it is clear that the total number of containers required would be over 400 million. About 150 lbs. of polyethylene will make a thousand 32-oz. containers—that means a potential market of at least 30-40 million lbs. for polyethylene.

Although no official quotes are given, current prices of the all-plastic containers are definitely higher than those of competing containers. But, the advantages of polyethylene may offset the price differential. One of the biggest pluses claimed is lighter weight, which will mean lower shipping costs. And since PE is chemically inert, there is no corrosion problem encountered when using it, as there is in using metal.

Still another feature of the all-plastic package is the variety of shapes and designs possible. Color, an important consideration in point-of-sale-merchandise, can be used extensively. Moreover, one company says, the plastic container is easier for the user to grasp with wet hands than are the other packages.

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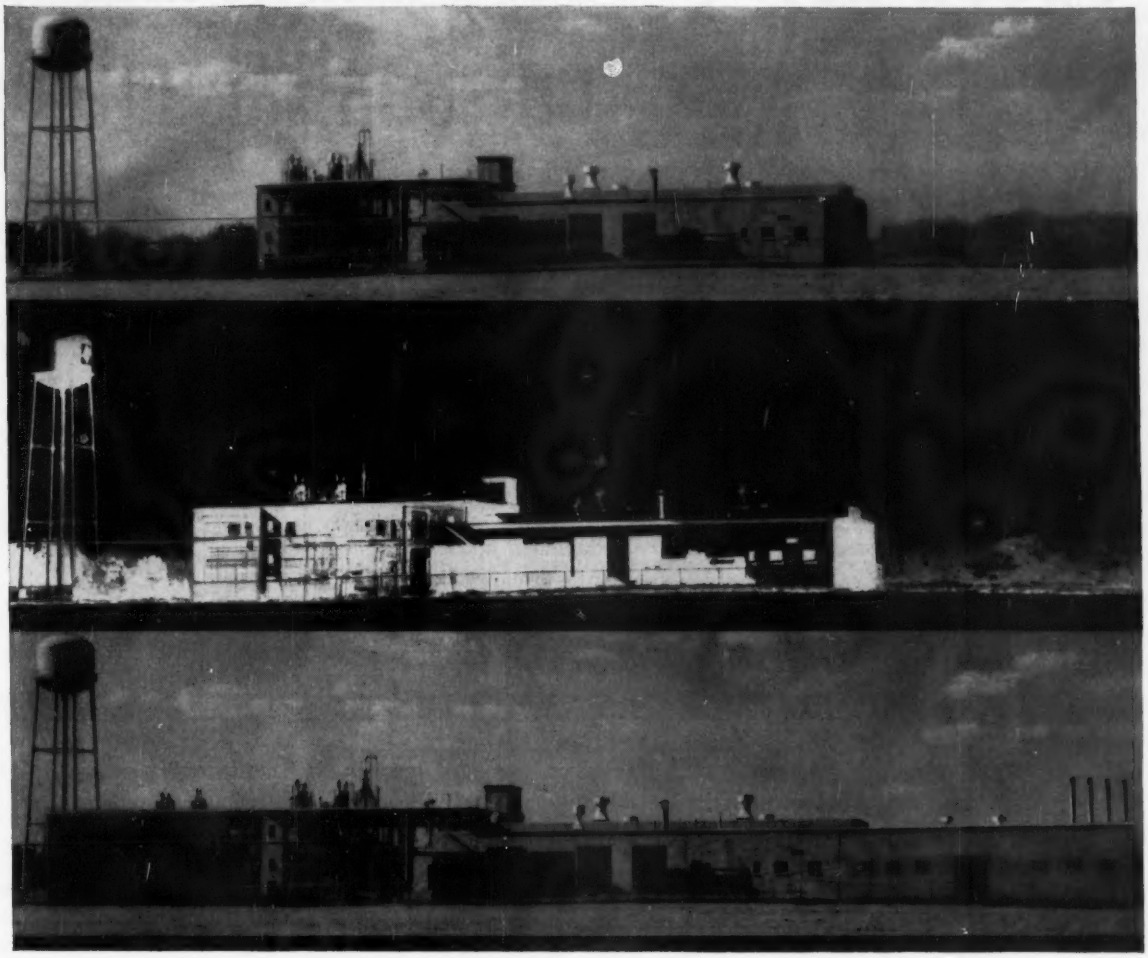

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3. save on engineering design and process development costs.
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Dehydrations—of aldols and ketols, catalytically or thermally, to yield such compounds as crotonaldehyde, mesityl oxide and isobutylidene acetone.

Dehydrogenations—of primary or secondary alcohols in liquid or vapor phase reactions to give, as examples: acetaldehyde, propionaldehyde, acetone, methyl ethyl ketone, and methyl hexyl ketone.

Esterifications—of solids or liquids, saturated and unsaturated, mono- or polyhydric alcohols, and mono- or polybasic acids have been esterfied.

Hydrogenations—up to 2000 p.s.i.g. and 250°C. with various catalysts. Partial, selective hydrogenations of unsaturated aldehydes to saturated aldehydes such as 2-ethylhexenal to 2-ethylhexanal, and crotonaldehyde to butyraldehyde, have been carried out, along with experimental work on reducing the aldehyde group without hydrogenating the double bond, to give such compounds as allyl and crotyl alcohols. Complete reductions of aldehydes and unsaturated compounds have also been carried out to make butyl alcohol, 2-ethylhexanol, and isocaproic acid from 4-methylpentenoic acid. Hydrogenations are also valuable in upgrading materials with undesirable unsaturation or color.

Oxidations—of saturated and unsaturated aldehydes, alcohols and aromatic compounds catalytically with air to give acids containing no inorganic products other than catalysts. Examples of this type of reaction are the preparation of acetic, butyric, 2-ethylhexanoic, crotonic, benzoic, toluic and phthalic acids.

Custom Processing Department, Chemicals Division **Eastman** CHEMICAL PRODUCTS, INC.

subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE

Technology
Newsletter

CHEMICAL WEEK
July 18, 1959

Multipurpose chemical plants have an important role in two petroleum companies' plans for development and diversification of petrochemical products. One is a special fractionating unit, placed onstream last week at Humble Oil & Refining Co.'s Baytown, Tex., refinery; the other, a new synthesis facility currently under construction at the Philtex plant (near Borger, Tex.) of Phillips Chemical Co., a wholly owned subsidiary of Phillips Petroleum Co.

Humble's unit spans the gap between laboratory and plant-size equipment, will produce semicommercial quantities (up to tank-car lots) of high-purity chemicals by superfractionation of existing refinery streams. New products include olefins, diolefins, aromatics, paraffins and other petrochemicals.

Phillips' multipurpose plant will consist of several processing units, whose operation may be combined in various ways to produce a great number of different small-volume specialty chemicals. Projected products to be synthesized from Phillips' available supplies of petroleum raw materials include organic intermediates, pesticides and repellents, agricultural feed substances, drug and pharmaceutical intermediates.

The Phillips unit will turn out batches ranging from as low as 50-100 lbs. to several million pounds, with the bulk of the plant's output expected to fall in the range from 10,000 to several hundred thousand pounds. Construction is scheduled for completion in November.

•

Aerojet-General assumes exclusive U.S. rights to vacuum technology developed by National Research Corp. for production of missile fuel. Described as a long-range agreement, the contract covers processes, equipment and techniques that Aerojet plans to use for development and eventual commercial production of high-energy solid propellent ingredients.

•

A potential answer to some CPI low-temperature insulation problems is on trial in a floating power plant, part of the Air Force's ballistic-missile early warning system. Late last week, a 5,000-ton ship, coated with a new lightweight insulation, was towed from a Hoboken, N. J., shipyard to a point near Thule, Greenland. The ship, which will contain power-generating equipment, carried a 3-in. exterior covering of polystyrene, glass fibers and epoxies. An interior coat was applied below the waterline.

Borden Chemical, and Sullivan Plastics (Hoboken), developed modified Epiphen epoxy coatings and adhesives for building the 3-in.-thick layers (weighing only 10 oz./sq.ft.) of expanded poystyrene and glass-fiber mesh. The insulation's task is to prevent condensation and icing that would otherwise result from the temperature difference between the ship's interior and the Arctic weather (—50F).

Technology

Newsletter

(Continued)

A radiation method of making phenol and resins from benzene and water is sketched in a panel display at The Soviet Exhibition of Science, Technology and Culture now under way at the New York Coliseum. Benzene and water at 190 C is irradiated with 950 roentgens/hour, according to the Russians. Products are 55% phenol, 41% unspecified resin, 2% carbon dioxide, and traces of maleic acid, carbonyl compounds, pyrocatechol, and benzoic acid.

•

A low-cost method of recovering metals from sea water is the object of patent applications filed by Armour & Co. (Chicago) in the U.S. and 31 other countries. It's called a "soap and bubble" method, was developed by Prof. Felix Sebba of the Witwatersrand University (Johannesburg, South Africa) chemistry department, from whom Armour acquired the rights. Selected soaps "chase" minerals to the surface when bubbles are blown through the water. For example, potassium laurate added to cobalt solution, produces a green froth containing cobalt. Sebba calculates it should be possible to get 600 tons of aluminum, 2 tons of uranium, or 240 oz. of gold daily from the sea. "A small sea area would be fenced off; pipes laid on the ocean bed would introduce bubbles of the required soaps. The minerals could then be collected on the surface. Which mineral is chased to the surface would depend on the kind of soap used."

•

A new tranquilizer said to feature high potency and safety is offered now by Sandoz Pharmaceutical, (Hanover, N.J.). The drug, called Mellaril, is, generically, thioridazine hydrochloride. Chemically, it is 2-methyl mercapto-10-[2- (N-methyl-2-piperidyl) ethyl] phenothiazine. Secret of the drug's freedom from toxicity and side effects—e.g., jaundice, Parkinsonism and blood disorders—is believed to be the presence of an SCH_3 group on the phenothiazine group in a position normally occupied by a halogen.

•

Britain's Beecham Group (London) will spend $2.8 million to develop its line of synthetic penicillin derivatives (*CW Technology Newsletter, March 14*). The firm, which has a cooperative research agreement (*CW, April 18, p. 109*) with Bristol-Myers Co. (New York), will spend $700,000 of this proposed outlay on a new plant at Worthing (south coast of England). Four new penicillin preparations will be marketed in the next 18 months, says Beecham chairman H. G. Lazell.

•

Underground nuclear blasting techniques will be simulated by a series of non-nuclear high-explosive detonations starting late this summer. Purpose: to check seismic decoupling techniques designed to reduce the seismic signals of a nuclear explosion. AEC plans about 10 shots of up to 5 tons of high explosives, is negotiating for use of Carey Salt Co.'s Winnfield, La., mine.

Periodic Chart of the Atoms, Copyright W. M. Welch Mfg. Company, Chicago*

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SPECIFICATION	WHITE OLEINES		RED OILS			
	GROCO 6 USP	GROCO 5L Low Linoleic	GROCO 2	GROCO 4	GROCO 8	GROCO 18
Titre	2° – 5°C.	2° – 5°C.	3°C. max.	4° – 6°C.	8° – 10°C.	18° – 20°C.
Titre	36° – 41°F.	36° – 41°F.	37.4°F. max.	39.2°–42.8°F.	46.4°–50.0°F.	64.4° – 68°F.
Color 5¼" * Lovibond Red	1 max.	1 max.	1 max.	1 max.	1 max.	2 max.
Color 5¼" * Lovibond Yellow	8 max.	8 max.	10 max.	10 max.	10 max.	15 max.
Color Gardner 1933	2 max.	2 max.	—	—	—	—
Unsaponifiable	1.0% max.	1.0% max.	1.5% max.	1.5% max.	1.5% max.	1.5% max.
Saponification Value	199 – 204	201 – 206	198 – 203	198 – 203	198 – 203	204 max.
Acid Value	198 – 203	200 – 205	197 – 202	197 – 202	197 – 202	203 max.
% F.F.A. as Oleic Acid	99.5 min.	99.5 min.	99 min.	99 min.	99 min.	99 min.
Iodine Value (WIJS)	95 max.	90 max.	95 max.	94 max.	92 max.	85 max.
Refractive Index 50°C. (Average)	1.4500	—	1.4505	1.4500	1.4495	1.4485
Total Polyunsaturated Fatty Acids	—	3.5% max.	—	—	—	—
COMPONENT FATTY ACIDS						
C14 Myristic	5%	6%	5%	5%	5%	5%
C16 Palmitic	3%	2%	4%	5%	6%	10%
C18 Stearic	1%	—	1%	1%	2%	4%
C18 Oleic	82%	89%	80%	79%	77%	72%
C18 Linoleic	8%	2.5%	9%	9%	9%	8%
C18 Linolenic	1%	0.5%	1%	1%	1%	1%
MACKEY TEST: Time to reach 105°C.	over 7 hrs.	over 7 hrs.	over 4 hrs.	over 4 hrs.	over 4 hrs.	over 3 hrs.

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CW PHOTO—ED WALLOWITCH

Pfaudler Permutit's Proctor and Wolfe will guide company's big new push into the specialties field.

Service Specialists Turn Specialty Sellers

This week the Chemical Sales Dept. of Pfaudler Permutit, Inc. (Rochester, N.Y.), is moving ahead on a plan to intensify its marketing effort—a move that PP's top management hopes will propel the company into the ranks of major chemical specialty producers.

In the past, the Chemical Sales Dept. has functioned mainly as a service group with sales primarily limited to boiler-feed-water chemicals.

George N. Proctor, Permutit Co. vice-president, and Morris Wolfe, manager of the Chemical Sales Dept., tell *CW* that henceforth the company will dip into its reservoir of water processing technology and aggressively market the products it develops.

The first product to be introduced under the stepped-up activities of the company's enlarged department is a nontoxic water coagulant aid manufactured in Holland. For the immediate future, the company plans to introduce a new ion-exchange resin cleaner, new antifoam and combustion chemicals and coating amines.

The company will continue to emphasize development of its own products, say Proctor and Wolfe. But it will also be casting a covetous eye at companies that fit into its plans. Another possibility: the company will become more basic in materials.

Already, the department has been given more manpower and a big boost in budget.

Objectives of the expansion program, as outlined by Proctor, are:

(1) Extension of distribution from the area east of the Mississippi to all of the U.S. and Canada.

(2) A broader line of chemical specialty products.

(3) Entry into markets other than water treatment. Biocides, redox systems, polyelectrolytes and colloids, and polymer intermediates are all high on the list.

(4) Chemicals and equipment for gas treatment will be explored for sales possibilities.

(5) Hypoing of the department's sales from its present 2% of over-all company sales to 20%.

The Chemical Sales Dept. now catalogs about 100 products: coagulant aids, corrosion inhibitors, antifoam additives, chelating agents, combustion chemicals, fire retardants, fuel oil stabilizers, neutralizing and filming amines, modifiers, restoratives, dispersants and ion-exchange resins.

Wolfe characterizes the more au-

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tonomous existence of the Chemical Sales Dept. as "the birth of a company within a company." Wolfe says the department's new five-year expansion plan should give Pfaudler Permutit a means of stabilizing the up-down economic pattern of the capital-goods market, which PP, as an equipment supplier, now relies on heavily.

Wolfe believes the liquid treatment field is in for tremendous growth. Stiffer municipal ordinances are forcing companies to come up with more ingenious ways of treating their liquid wastes both internally and by mechanical methods, he says. Either way, PP stands to profit.

The new flocculant, Coagulant Aid 68, is an instance of PP's new willingness to go outside, if necessary, to strengthen its foothold in the field of water-treatment chemicals.

The product is a Holland-developed material, now being produced for PP by Koninklijke Bedrijven, K. and J. Wilkens, N.V. (Veendam) under the tradename Wisprofloc. What makes the product especially attractive to PP is its reported lack of toxicity. It has just been approved by the U.S. Public Health Service for use in potable drinking water.

The product is a chemically treated potato starch derivative, can be added to water either as a powder (in which form it is supplied) or as a solution.

Other coagulant aids now approved for use by Public Health Service's Technical Advisory committee include Allen Chemical Co.'s Claron; Burtonite Co.'s Burtonite 78; E. F. Drew's Drewfloc; Electric Chemical Co.'s Catalyser 146; Hagen Chemical and Control's 2, 7, 11, 18, 801, 952; Hercules Powder's CMC; Kelco Co.'s Kelgin W and Kelcosol; Nalco's Nalcolyte 110; Stein, Hall & Co.'s Jaguar; Permutit's 64, 65, 67, and now 68.

Dow Chemical now has a water-treating material before the U.S. health group for testing, and Monsanto, a newcomer to the field, is also working on one.

Pfaudler Permutit will continue to sell water-treatment equipment as its major function; but from here on, the Chemical Sales Dept. won't be content to merely serve as a technical service group. The outward-looking orientation of the sales department could bring a potent new competitor to the chemical specialties field.

World Aerosolers Meet

Over 400 representatives of aerosol manufacturers and industrial users from 16 countries turned up at the Maison de la Chimie in Paris recently to discuss problems and prospects of the aerosol industry.

Occasion was the first International Aerosol Congress, sponsored by the European Federation of Aerosol Assns.—an organization based in Zurich, Switzerland, and set up this year by committees from France, Germany and Finland.

The congress included a symposium the first day on such subjects as physicochemical problems involved in perfuming of aerosols, application of aerosols to the pharmaceutical industry, determination of granulometric characteristics of aerosol spray, protective varnishes, possibilities of standardization in the aerosol industry, and an open discussion on propellents.

Delegates of the aerosol organizations, meeting the second day, agreed to work towards uniformity of glass and metal packaging. Standard for glass will be drawn up during the coming year by the French Aerosol Committee. The German committee will work on norms for the metal units.

Delegates also elected officers of the European Federation of Aerosol Assns. Gerald M. Mayer of the U.S., president of the International Aerosol Assn. and Director of Precision Valve International, was elected president. The two vice-presidents are Francois Harlan of France, vice-president of the French Aerosol Committee and president of Establissements de Trevise; and Wilhelm Staehle, president of the German Aerosol Committee and general manager of Mouson of Germany.

Member organizations of the European aerosol federation are the International Aerosol Assn., headquartered in Zurich and grouping countries that have no national committees; Interessen Gemeinschaft Aerosol of Frankfurt (German committee), Comite Francais des Aerosols of Paris and the Finnish Aerosol Assn.

National committees, which will apply for membership in the European federation, are now being set up in England, Spain, Italy and Denmark.

Delegates to the first International

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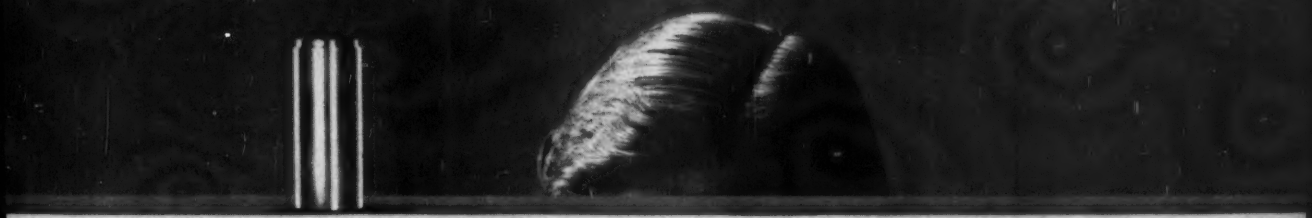

THIS SHAFT SLEEVE FITS 40 SIZES

THIS SHAFT FITS 39 SIZES

THIS BEARING FITS 55 SIZES

THIS MECHANICAL SEAL FITS 40 SIZES

THIS PACKING FITS 40 SIZES

HOW TO REDUCE YOUR INVENTORY OF SPARE PUMP PARTS

Many process plants have found a way to reduce their inventory of spare pump parts as much as 50% . . . and still maintain the same degree of protection.

The secret of their success lies in standardizing on Worthington's SESC (for Standard End Suction Centrifugal) line. Developed by Worthington primarily to meet the special requirements of the chemical industry, this line incorporates the maximum number of interchangeable parts.

Just four basic designs cover the complete SESC line of six different types and 120 different sizes. Some idea of the high degree of interchangeability of parts can be gained from the photo above. Of the 120 sizes in the complete line, one shaft is used in 39 sizes, one bearing in 55 sizes, one frame in 57, one packing in 40, one mechanical seal in 40, and one shaft sleeve in 40 sizes.

What this means to users is readily apparent. Any group of SESC pumps will have many interchangeable parts. Result: necessary spare parts stocks can be significantly reduced.

This isn't all. If you know one SESC pump, you know them all. Maintenance men quickly become familiar with construction details. Their work is simplified and costs reduced.

Begin to take advantage of the cost reduction available through use of the Worthington SESC line. Available in ratings up to 2,700 gpm and 550 ft. head. For information, see your nearest Worthington representative or write to Worthington Corporation, Section 20-9, Harrison, N. J. In Canada, Worthington (Canada) Ltd., Brantford, Ontario.

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SPECIALTIES

Aerosol Congress came from Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Holland, Israel, Italy, Norway, Spain, Sweden, Switzerland, Yugoslavia and the U.S.

PRODUCTS

Titanium Alloy Additive: Chicago Development Corp. (5810 47th Ave., Riverdale, Md.) is offering a vanadium additive for titanium alloys. It's called Van-Ad, is sold in the form of fine crystals. It's recommended for incorporation in titanium alloys where use of aluminothermic vanadium is unsatisfactory. Trial quantity price: $35/lb.

•

Paper Dye: American Cyanamid (New York) offers a new liquid dye for paper called Green MX Liquid. Advantage: dust-free handling.

•

Antistatic Agent: Onyx Oil & Chemical Co. (Jersey City, N.J.) has developed a new form of its antistatic agent. The cationic polyamine antistatic agent, called Aston AP, is claimed to afford nondurable protection against static charge formation.

•

Ansul Alters Arsan: Ansul Chemical Co. (Marinette, Wis.) has boosted the purity of its cacodylic acid herbicide by 20% and changed the product's name from Arsan to Ansar. Recommended for renovating pasture and sod, the product is characterized by an apparent lack of residual toxicity.

Product specifications: cacodylic acid (raised from 55 to 75%); trivalent arsenic, less than 0.5%; inerts, 24.5%.

•

Germicidal Cleaner: Multi-Clean Products, Inc. (St. Paul 16, Minn.), is offering a new antiseptic-cleaner, Staph-Trole, which combines a germicidal agent with a nonionic detergent. Wetting and penetrating action of the detergent, the firm claims, greatly increases the efficiency of the germicidal ingredients. Lab tests are said to show that *staphylococcus aureus* is destroyed at a dilution of 1:200.

•

Dutch Treatment: Kunstharsfabriek Synthese N.V. (Holland) now is marketing to American paint manufacturers a medium oil-length alkyd

Aerosol packaging captured 41% of the $119,000,000 insecticide market

If your product can be brushed, poured, sprayed or squeezed, this profitable new packaging idea can generate sales for you, too!

Consumers spent more than $119,000,000 for bug killers in 1958, and aerosol packaging controls the most profitable share of this growing market. $49,000,000 worth of aerosol-packaged insecticides were sold at 3 times more retail profit per unit than insecticides packaged by other methods.

The reasons for this success are simple. Aerosols deliver the product in a completely new form that's easier, more effective and often more economical to use. If your product can be brushed, poured, sprayed or squeezed, you stand a good chance to add new sales appeal—create vast new markets—if you package it in an aerosol.

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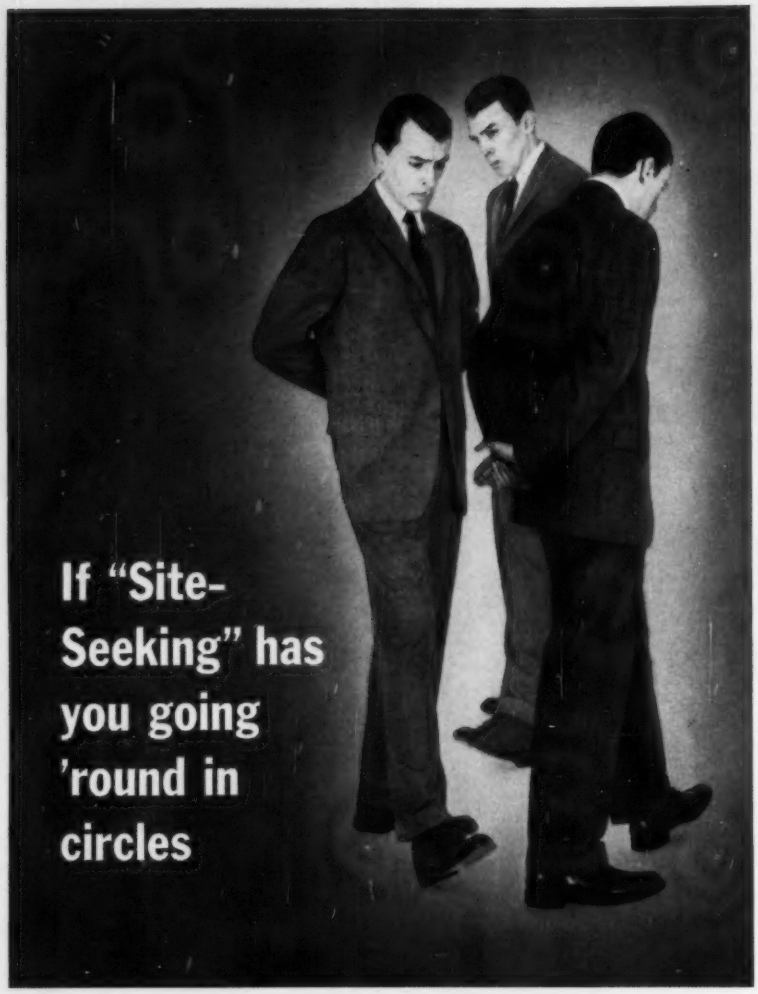

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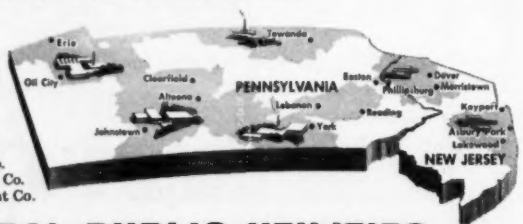


GENERAL PUBLIC UTILITIES CORPORATION

Att: Wm. J. Jamieson, Area Development Director, Dept. CW-4
67 Broad St., New York 4, N. Y. WHitehall 3-5600

SPECIALTIES

resin based on linseed oil. The new product, called Setal 20, is claimed to dry and harden quickly. Suggested uses: in rust-preventing paints, dipping and stoving enamels, air-drying and forced-drying repair enamels for cars and trucks. New stoving enamels also are available from the Dutch firm. The Netherlands Trade Commission (New York) will provide additional information on request.

•

Bacteria-Killing Cakes: Kleenaire Kemikils, Inc. (2227 24th St., Detroit) is incorporating bacteriostatic agents in its paradichlorbenzene mothproofing and odorizing cakes. The cakes, sold under the Puratized tradename, are claimed to set up a zone of inhibition in the drain. Result: elimination of odor, bacteria and algae, the company reports. Marketing to hotels, restaurants, institutions, etc., begins this month.

•

Fire-Resisting Paint: Nor-Chem Products (27 Haynes Ave., Newark 12, N.J.) offers a new fire-resisting paint, called Fire-Poof, says a blowtorch flame merely scorches it.

•

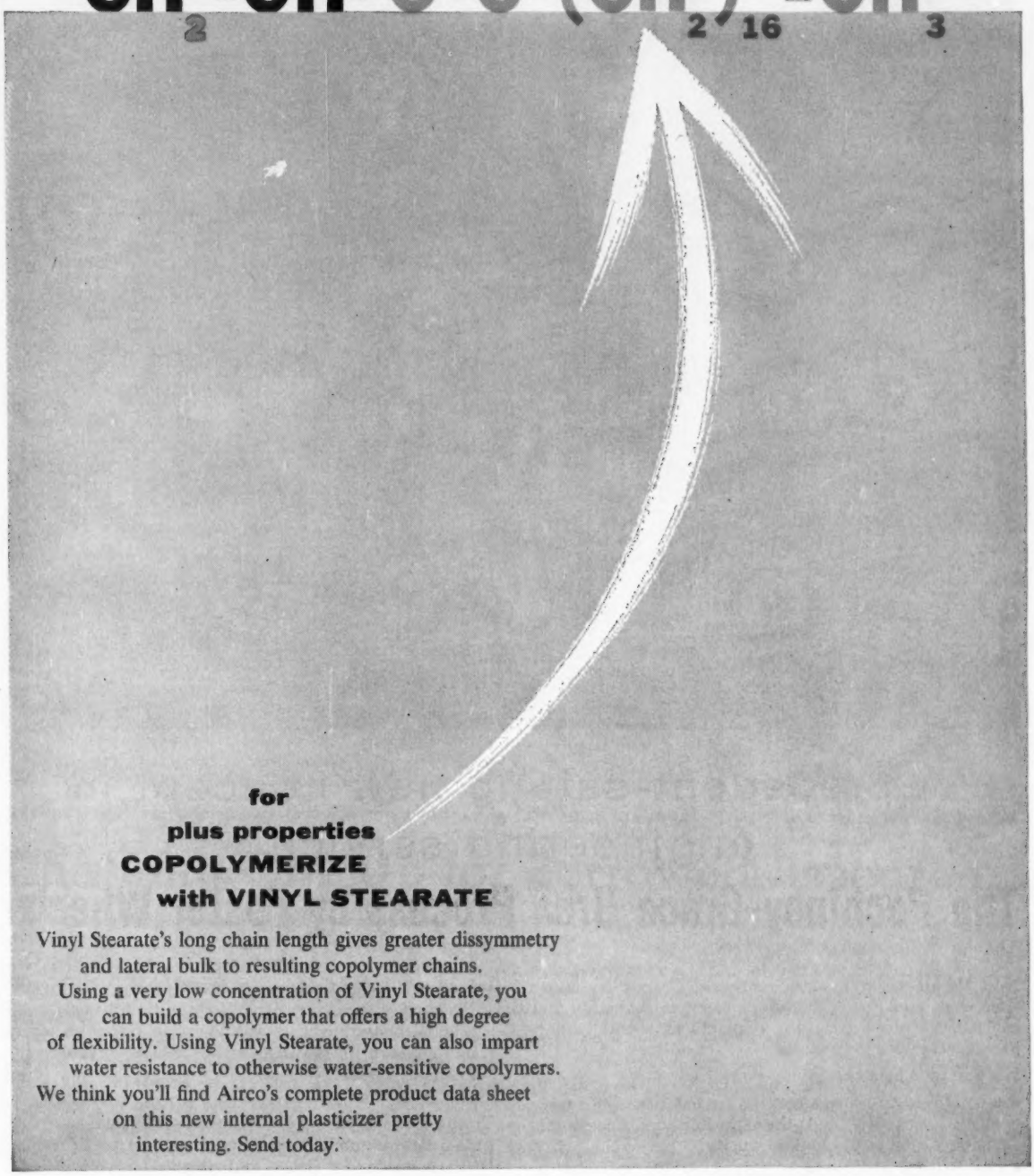
Spray Dressing: Rezifilm, a new surgical spray dressing for pre- and postoperative use is being marketed by E. R. Squibb & Sons (New York). The product, available in 2-oz. aerosol dispenser cans, forms a strong, flexible, clear film when sprayed on the skin.

•

Dye for Oil: American Cyanamid (New York) has developed a new granulated red dye that's claimed to eliminate dusting problems in storage and handling. It's intended for use in coloring gasoline. Called Calcogas Rocket Red, the product is characterized by nondusting, noncaking, soluble properties. It's said to resist change of physical state, even at elevated refinery storage-area temperatures. Yellow, orange and blue dyes are also available.

•

Less Gloss Loss: Sherwin-Williams Co.'s new U.S. patent 2,886,456 covers treatment of gloss oleoresinous paints with a succinic ester wetting agent. The agent prevents loss of gloss while paint film is drying. A small percentage (0.5 to 2% by weight) of the wetting agent cuts down condensation of moisture on film surface.



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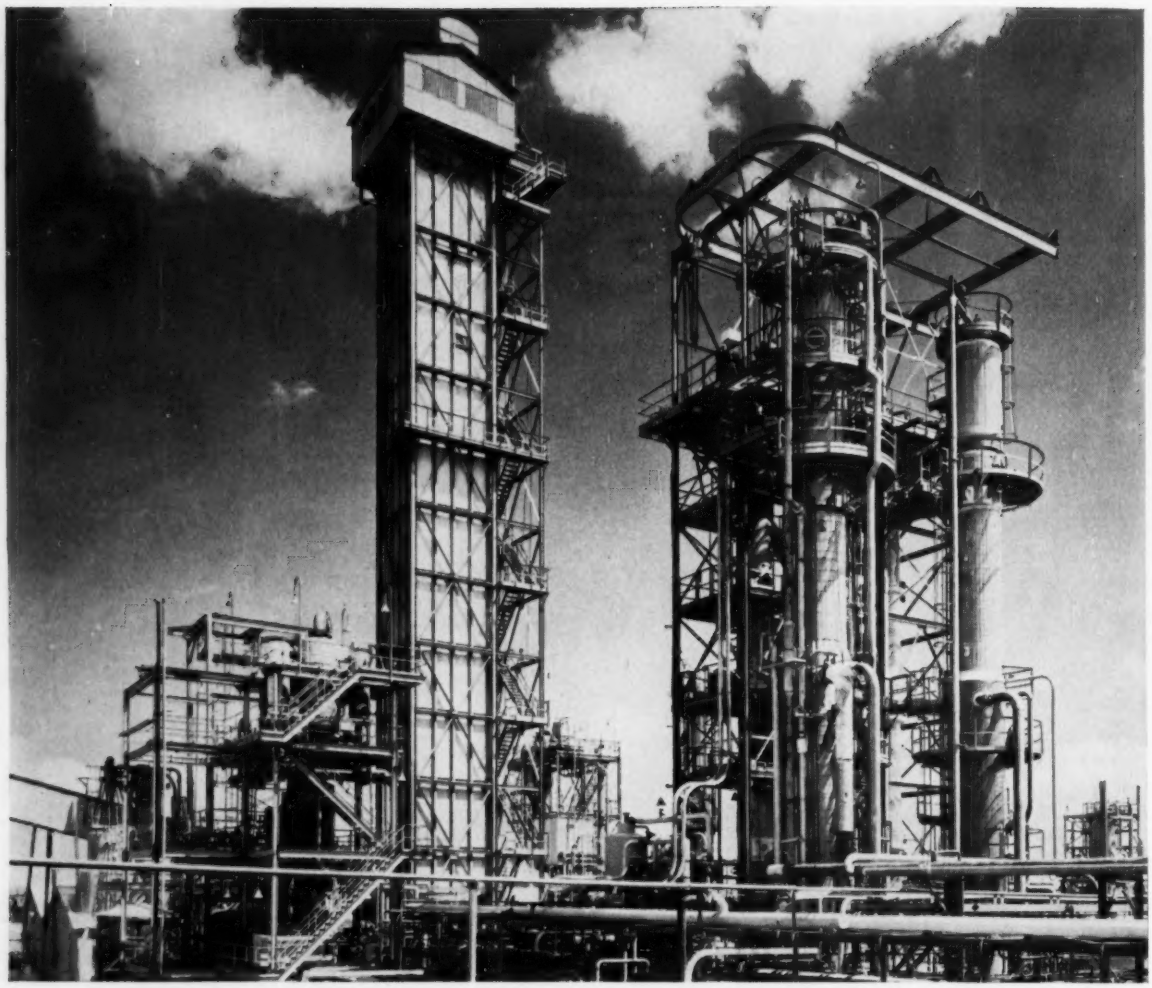

A precedent-setting new concept in engineering service

The Pechiney-Grace Urea Process by Foster Wheeler

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It's a unique package, giving you:

- a total recycle process covered by one licensing agreement, from feed end through finishing operations, yielding urea of the highest purity.
- the benefits of experience gained by W. R. Grace in modifying and improving the original Pechiney Process and operating a full-scale plant for four years.
- Foster Wheeler's experience in originally bringing the Pechiney Process from pilot plant to full-scale commercial operation, and working with Grace engineers on subsequent improvements which created the Pechiney-Grace Process.

The new license package also makes available for the first time a new ammonia recovery system—currently saving 10-15 tons a day for Grace, and a highly efficient purification system. For information write to: *Foster Wheeler Corporation, 666 Fifth Avenue, New York 19, N. Y.*

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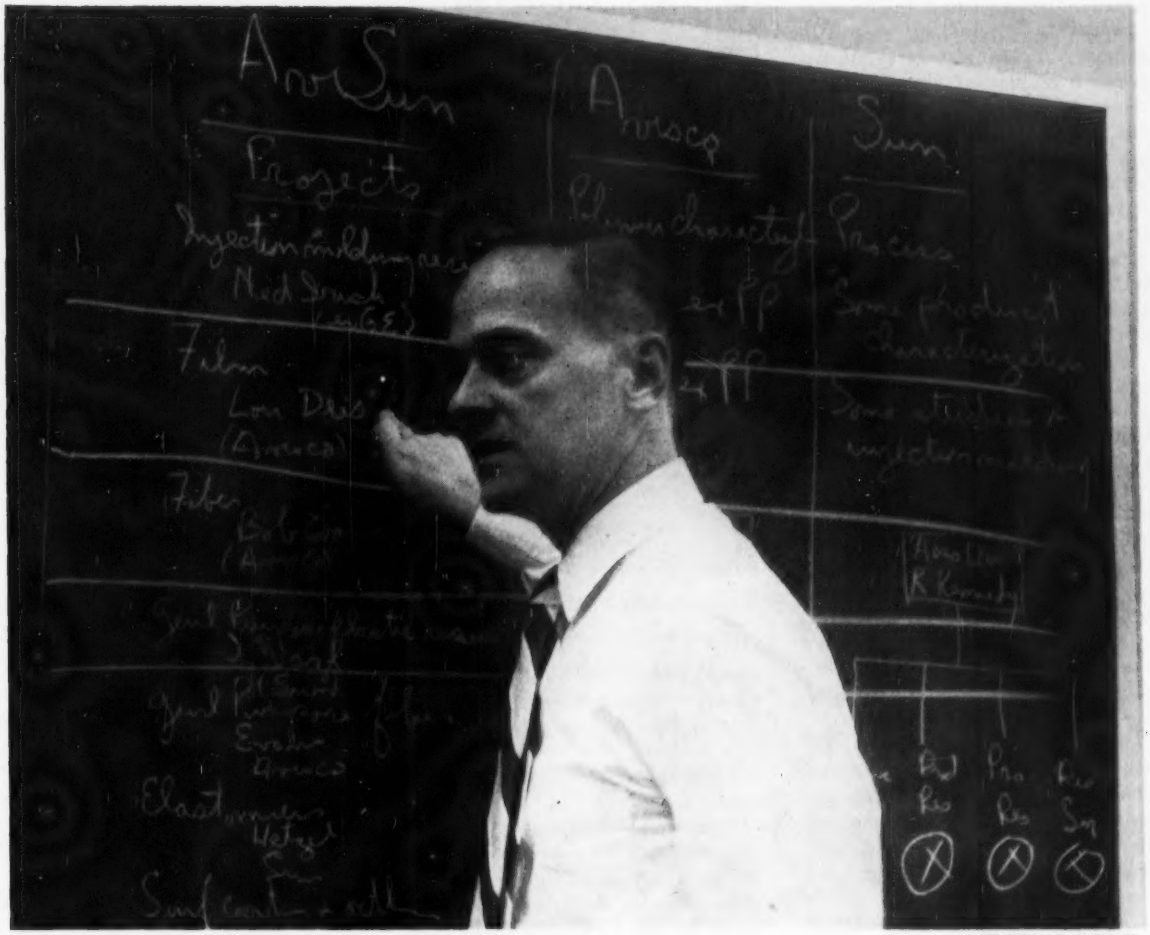

CW PHOTO—H. SALTZMAN

AviSun's Setterstrom shows organization allowing firm to make most of parent companies' research.

Chalking One Up for Borrowed Research

Deft use of borrowed research manpower and space is starting to pay off this week for AviSun Corp. (Philadelphia), equally owned by American Viscose and Sun Oil.

When the firm was formed early this year to make polypropylene, a time shortage forced it to borrow both personnel and lab facilities from the parent companies to work out process details, probe resin applications. Now, AviSun is about to turn out its first commercial polypropylene in a 20-million-lbs./year plant leased from Koppers at Port Reading, N.J. And an AviSun film and fiber plant is going up at Newcastle, Del.

Keys to this success were efficient integration of polypropylene research projects split between Sun and Avisco, plus an element of luck in finding these programs jibe with a minimum of overlap. The technique AviSun used is worth close scrutiny by other chemical firms embarking on a joint commercial venture.

Shortly after its formation Feb. 13, '59, AviSun set up a research planning committee of top management to select projects, guide progress. The committee's instructions are funneled through one man at each of the Avisco and Sun plants, then on to project leaders. There is a leader for each of 10 projects, which are scheduled for varying time periods.

Planning committee member Carl Setterstrom, AviSun's commercial development head, describes the arrangement this way: AviSun contracts for all project costs. Most project leaders retain either Sun or Avisco affiliation. Working for AviSun, they are responsible for budgeting the projects (e.g., on film or fiber) and scheduling use of equipment. Facilities of either parent company can be used in connection with this work. In case of project conflict, for example, in scheduling pilot-plant production of experimental resins, the problem is ironed out between the two men reporting to the planning committee.

Setterstrom recalls that the first problem AviSun faced was resolving conflicts and redesigning already-started programs in polypropylene re-

search at Sun and Avisco. In '56, the two firms independently initiated research on polypropylene. By '58, each company was spending about $1 million/year on this work—Avisco, primarily on film and fiber, using purchased (mostly from Hercules) resin; Sun, on its own polypropylene process, with some applications research included in the bargain.

Says Sun's Research Director Robert Kennedy: "Sun was fully prepared to 'go it alone' in polypropylene" and had done an appreciable amount of product development work, particularly in molding.

"We didn't want to limit ourselves at all," says Kennedy. "We were operating on the principle that we would need a complete line of products, including film and injection molding—fiber could wait. We had completed a fair amount of research on matching our basic resin against characteristics needed—a fairly well founded and documented story on how to control its properties."

Now, polyolefin work for AviSun continues to be done in the basic, product, process, and research services branches of Sun's research.

"Until AviSun was formed last February," Setterstrom says, "neither company felt it could fully disclose its research results. We find now that the two research programs dovetail well; and now all patent rights are vested in AviSun."

More than Research: The fortunate fitting together of the two research programs reflects the neat matching of the manufacturing interests of the companies. Sun owns oil reserves, ships and refineries. For every 100 lbs. of crude going into its refineries, it gets 1 lb. of propylene. It is experienced in catalytic process development (Sun put one of the first large-scale commercial catalytic cracking plants onstream in '37) and polypropylene is made with catalysts. [Item: Sun won't divulge its process except to reveal it requires an organometallic catalyst, as do Ziegler's and other known processes.] Also Sun is financially strong, long on marketing know-how, and experienced in joint ventures (e.g., SunOlin, Claymont, Del., urea maker). All this adds up to a foreseeable interest in making polypropylene resin.

Avisco, on the other hand, has a long history of fiber and film research, understands marketing, manufacturing, and product requirements. Avisco has also had experience in joint ventures, most notable of which is Chemstrand, co-owned with Monsanto.

CW PHOTO—H. SALTZMAN

Sun's Kennedy does 'contract' work.

Temporary Program: Although borrowed research has worked well for AviSun, it is admittedly a short-term measure. And it has created somewhat of an additional burden for the two parent companies. Sun has made only a few changes in its research program under the new setup, and Kennedy says the current program appears to be working reasonably well.

Avisco has set up a separate polyolefin department under Manager John Howsman; it retains its basic research (formerly headed by Howsman), development, and services departments separately in its research and development division.

Perhaps late this year, or in '60, AviSun staffers at Sun and the olefin specialists at Avisco will be combined at Avisco's labs. Eventually, AviSun hopes to build its own research laboratory, separating facilities and staff.

Meanwhile, AviSun has gained time—critically important in getting into the infant polypropylene field—and is learning more about its men, their abilities, and their progress.

More Oral Vaccine

Lederle Laboratories, division of American Cyanamid, this week told CW of its plans to spend $1 million to expand facilities to produce a live oral polio vaccine at a 40-million-doses/year rate.

The expansion comes in spite of Public Health Service refusal to grant licenses to sell the live-type vaccine at this time. Reason for Lederle's optimism and willingness to spend much capital: in clinical tests on 700,000 persons of all ages in 21 countries, there has not been a single adverse reaction.

Lederle's Case: Lederle spokesman Herald Cox says that a "present series of trials designed to immunize all the children in Costa Rica under the age of 11 (500,000 of them) should be the clincher." In the 700,000 earlier tests, each person was fed three separate doses of live vaccine (each received a dose of Type I, II and III polio virus). In the Costa Rica test, the three are combined, to make the first large-scale test of the polyvalent type.

Emphasizing the above evidence of the vaccine's safety, Lyman Duncan, Lederle's general manager, outlined these other factors considered essential in evaluating a live vaccine:

• Efficacy. The ability of the vaccine to immunize has generally been in the 80-90% range, as high as 100% in certain instances. The "durability" of immunization is unknown, but Duncan says that an estimate based on other live vaccines being used today (e.g., yellow fever, smallpox)

Lederle's Cox: New foe for polio.

WHAT'S NEW IN RARE EARTHS

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a report by LINDSAY

New . . . new . . . new. It's the old but still magic word that keynotes industrial planning for the products that may be big profit winners in the 1960's.

R&D work, in laboratories from coast to coast, is happily blessed with huge budgets for the ever-continuing search for what is new. New in processes, in methods, in materials. Whatever is new that will contribute to the development of new products to captivate the public fancy and meet the critical needs of industry.

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You may say the rare earths are not new. True. We've been working with the rare earths for more than 50 years. Many industries have known and used them for years. *But they may be new to you.*

What *is* new in rare earths will command your attention and intrigue the interest of your people concerned with research and development work.

There's new availability in the rare earths! Commercial grades can be shipped promptly by the ton or carload. High purity grades up to 99.99% can be shipped in surprisingly large quantities. It may be news to you that Lindsay is currently producing more than 100 rare earth, yttrium and thorium salts for R&D work as well as for normal production operations.

There's new low pricing of rare earths. Costs have tumbled sharply during recent years. Partly because of rapidly increasing demand. Partly because of vastly expanded production facilities and improved techniques in refining our materials. (Which came first—the hen or the egg?) The important fact is that the rare earths are priced so low as to make their use extremely interesting. We are talking, in many cases, about ¢, not $.

Rare earths now available in metal form. Interested? You can obtain rare earth and yttrium in metal form, primarily as ingots and lumps. They are presently available in experimental quantities and offer interesting promise to many industries.

There are many new uses for the rare earths. This obviously is the result of research and development work carried on during recent years. In glass and ceramics. In electronics. In commercial nuclear energy. In plastics. In glass polishing. And in many other fields.

We would be modest indeed if we failed to hint that much of the rapid expansion—first in research and then in actual industrial use of the rare earths—has been at our gentle urging.

The facts speak for themselves. Rare earths have come of age. They are important production materials in a broad cross-section of American industry.

So if you are thinking *new* . . . new ideas, new processes, new materials, new products . . . look at the rare earths.

When you do, please remember these two facts. They are readily available in the grades, varieties, forms and quantities you will need. And they are priced at surprisingly attractive levels.

Our technical people will be happy to be helpful to you. We can supply pertinent data and will promptly supply detailed information if you will indicate your specific area of interest.

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places immunization at four or five years. No comparison can be made with the Salk "killed" type vaccine now used, since no figures are available for it, either.

• Ease of administration: A single dose of the live vaccine—a cherry-flavored liquid—can be given by spoon, probably the easiest method of vaccination that can be devised. It will make mass inoculation in epidemic or underdeveloped areas quick and easy.

• Stability: The vaccine is stable at room temperature for five weeks; under refrigeration, eight months (so far) with no loss of potency.

• Uniformity of product: Lederle reports the production of 30 batches over a two-year period, standardized as to safety, potency, purity, with no exceptions.

Other points Duncan chalks up for the vaccine: price will be less than that of Salk vaccine; a natural immunity chain is apparently set up in families of vaccinated newborns, thus protecting all.

Government's Case: The U.S. Public Health Service is wary of possible dangers in the live-virus form of vaccine. However, PHS officials went to a recent Conference on Live Polio Vaccines* prepared to issue a "be careful" report, reportedly softened their opposition after a second look at the evidence.

PHS's stand is that, while "there is much favorable progress, . . . the solution remains to be found to the difficult problems in the development, control, evaluation of the safety and effectiveness of experimental live attenuated polio virus vaccines . . . trials to date have been in nations where children normally develop immunities at an early age. . . . Much remains to be done in the development of commercial production in terms of safety, purity, potency before licensing for commercial sale becomes a reality."

Although Lederle is apparently the closest to commercial reality of live oral polio vaccine, the pharmaceutical industry cites the difficulty of patent protection in biologicals. Other live polio strains, too, such as those of Dr. Albert Sabin (University of Cincinnati) and Dr. Hilary Koprowski (Wistar Institute), may be formidable current competition. And should the demand become too great, the government reportedly may take a part in licensing arrangements, put the vaccine in the public domain.

But with $7 million invested in prior research, and $1 million more to be spent in the coming months, it's a sure bet that Lederle will take all steps necessary to convince PHS of its right to a go-ahead.

* Sponsored by the Pan American Health Organization and the Pan American Sanitary Bureau of the World Health Organization at Washington, D.C., June 22-26.

EXPANSION

• The General Chemical Division of Allied Chemical Corp. (New York) will move a substantial portion of its New York office to its Morristown, N.J., location. Included: New York Research and Patents Dept.

• Cross Co. (Detroit) has acquired Stephen F. Malaker Associates and established the Cross-Malaker Laboratories Inc. (Mountainside, N.J.). Cross Co. is primarily engaged in developing and producing automation machinery and techniques. Malaker Associates has been a radiation consulting firm in the nuclear and electronics fields.

• Spectran Laboratories Inc. (Lakewood, Colo.), a new firm, will specialize in chemical analyses.

• Hardesty Research and Development has built a new lab in Santa Ana, Calif. The company develops and builds filament-wound plastic structures; prepares coatings for rocket nozzles, re-entry nose cones.

PRODUCTS

Gasoline Additives: Union Carbide Chemicals Co. (New York) has introduced two new phosphorus-containing gasoline additives, neither having an effect on the octane rating of gasoline. Ucar 4BP is tetrabutyl pyrophosphate, is recommended for use as a preignition suppressor and spark plug antifouling agent. Ucar 2CP is 2-(2-chloroethoxy)-5-ethyl-5-methyl-2-oxo 1,3,2-dioxaphosphorinane, is recommended as a lead scavenging agent as well as for the uses to which Ucar 4BP may be put.

•

Antiarthritic: Upjohn Co. (Kalamazoo, Mich.) has developed Medaprin, a mixture of the corticosteroid methylprednisolone with aspirin and calcium carbonate. It's reportedly useful for treating rheumatoid arthritis.

ADVERTISEMENT—*This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

July 18 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1959

New Managerial Positions Created in U.S.I. Sales

W. E. JOHNSON

Warren E. Johnson, Vincent D. McCarthy and George H. Stanton have been named to fill three new sales management positions which have just been created by U.S.I.

Mr. Johnson, who is appointed Director of Chemical Sales, will have responsibility for Industrial Alcohol and Solvents, Heavy Chemicals, Sodium and Special Products Sales, with the manager of each product group reporting to him. Mr. McCarthy as Director of Plastics Sales, will have responsibility for management of polyethylene sales, as well as other plastic materials that the company might produce in the future. Mr. Stanton, who will assume the position of Director of Field Sales later in the year, will supervise the activities of regional sales offices. The three new appointees will report to Alden R. Ludlow, Jr., Vice President in Charge of Sales.

V. McCARTHY

G. H. STANTON

"We are confident these important changes will considerably strengthen our sales organization," Mr. Ludlow says, "and enable us to keep pace with our increasing business."

The new Director of Chemical Sales, Warren Johnson, has been Manager of Alcohol and Chemical Sales for U.S.I. Vincent McCarthy, Director of Plastics Sales, has been Manager of PETROTHENE® Polyethylene Sales. And George Stanton, Director of Field Sales, has been Manager of the U.S.I. Chicago Sales Division.

All-Titanium Centrifugal Pumps and Valves Are Now Being Produced

Centrifugal pumps and valves made of commercially pure titanium have been developed to meet the ever increasing need for more corrosion resistant equipment in the chemical industry. Made to order, pumps are available in sizes from 1" x 1" and capacities from ½ gpm. Valves are available in a size range of 1" through 4", and nonlubricated and non-sticking plug valves are also available in sizes of ¼" through 3".

This equipment, designed in titanium specifically for the highly corrosive environments found in chemical plants, is said to be very competitive pricewise with similar units fabricated from nickel-base alloys. The titanium used is a product of Mallory-Sharon Metals, owned one-third by U.S.I.

1958 Aerosol Survey Results Are In; Production of Nonfood Units Estimated at 20% Above 1957

Hair Sprays Still Sales Leader; Dental Cream, Pet Product Sales Large Enough for Separate Statistical Categories.

At the Chicago meeting of the Chemical Specialties Manufacturers' Association this May, it was announced that an estimated 470 million nonfood aerosol units were produced in the U.S. in 1958, with an approximate value of $470 million. This is an increase of 20% over the 1957 estimate of 390 million units. Estimates are based on reports from 45% (95 out of 211) of the known aerosol fillers in the country, plus reports from container and valve makers. By comparison, CSMA estimated 320 million units in 1956, 240 million in 1955, and 185 million in 1954. Industry production has been climbing steadily over the eight years in which surveys have been made, and has been very rapid when compared to most other industries.

The actual number of units reported for 1958 was 341,383,496. For the third consecutive year, hair sprays were in undisputed first place, accounting for 27% of the total units reported. Although only 92.6 million hair spray units show up on the survey, CSMA believes that over 100 million were actually produced. Room deodorants were reported at 49.8 million units, which indicates a continued growth. The 1957 reported figure was 42 million. CSMA believes that insect sprays, room deodorants, coatings and shaving lather were all actually produced in excess of 60 million units last year, although the reported figures are considerably lower.

Two New Statistical Categories

Dental cream, treated for the first time as a separate category, showed 12.9 million

MORE

NONFOOD AEROSOLS REPORTED IN 1958 COMPARED TO 1957

(figures in millions of units)

Product	1958	1957
Hair Sprays	92.6	94.4
Room Deodorants	49.8	42.0
Shaving Lathers	45.3	50.9
Insect Sprays	42.3	41.5
Coatings	30.1	36.5
Colognes & Perfumes	13.6	17.9
Dental Creams	12.9	*
Household Products Other Than Room Deodorants	25.9	28.1
Personal Products Other Than Hair Sprays, Shaves, Dental Creams, Colognes & Perfumes	14.5	12.4
Miscellaneous	14.4	15.6
TOTALS	341.4	339.3

*not reported separately in 1957

Researchers Uncover More Uses of Methionine in Body

Recent work with radioisotopes by the Biology and Medicinal Division of the Argonne National Laboratory has revealed that methionine in the body, when converted to adenosylmethionine, can participate in epinephrine synthesis; react with niacin; enter the brain; and help form spermine, ergosterol and histamine.

New Ultraviolet Absorber Developed for Polyethylene

A new compound now in the process development stage has recently been made available to polyethylene manufacturers for evaluation as an ultraviolet absorber. The material — 2,2'-dihydroxy-2-n-octoxybenzophenone — is compatible with polyethylene because of the long n-octyl chain, and it is said to absorb strongly in the 300-375 millimicron UV range.

In field tests made by the producer with 10-mil polyethylene film, it was found that incorporation of 0.171% by weight of the absorber was adequate to retain 85% elongation after two months' use in an area of strong sunlight.

Currently, carbon black is the only effective UV absorber compatible with polyethylene and used to protect the plastic in outdoor service. The new compound is a pale yellow powder and, if proven successful in practical application, will permit the outdoor use of clear and colored polyethylene goods.

New System Developed For Extruding Metallic Sodium in Wire Form

For many reactions, where small amounts of sodium in wire form are required, there has long been a need for equipment capable of producing wire from the standard one-pound cylindrical sodium brick, with minimum loss and effort.

MORE

CONTINUED

Aerosols

units. Again, the reported figure is believed to be substantially less than the number of units actually produced. Veterinarian and Pet Products, the other new category on the questionnaire, showed a reported figure of 3 million units. Serious consideration was given by the CSMA committee to the inclusion of food products in the 1958 survey. However, after careful weighing of the various factors involved, it was decided to postpone inclusion until 1959.

U.S.I. Products Used in Aerosols

Two U.S.I. products, ethyl alcohol and polyethylene, have played an important role in the steady growth of the aerosol industry. Anhydrous ethyl alcohol is virtually a universal ingredient in hair sprays, room deodorants, perfumes and colognes, and is widely used in other personal products and in pharmaceuticals now sold in aerosol form. Polyethylene is an important component in packaging, being used for dip tubes and valve parts. U.S.I. provides nationwide distribution of these products, and technical assistance on their use.

Aerosol industry leaders predict a continued rise in the sales curve. One of the largest makers of containers forecast recently that total production of aerosols should reach 555 million units this year.

Ethyl Alcohol Permits Two-Color Dyeing Effects On Cotton-Acetate Fabrics

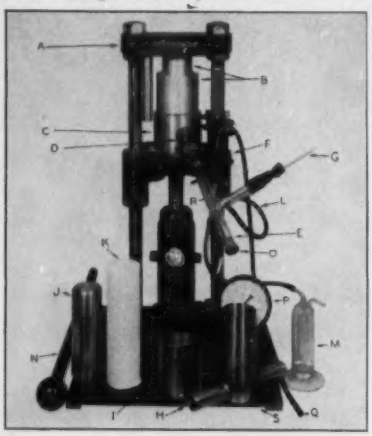
It is reported that in the vat dyeing of cotton-acetate fabrics, ethyl alcohol has been employed to achieve two-color effects by differential swelling of fibers. The fabric is treated at 40°C in a weak alkaline solution containing vat color and 70% ethanol in equal parts.

The acetate fibers are said to take the dye strongly, while the cotton fibers remain practically undyed. Cross-dyed effects can be achieved by dyeing the cotton in a subsequent bath without ethanol. The ethyl alcohol acts by swelling the acetate fibers and depressing any swelling of cotton.

CONTINUED

Sodium Wire

Researchers at the U.S.I. laboratories in Cincinnati have recently developed such a system, which is described completely in a technical data sheet now available. A photograph of the system, with descriptive legend, appears below. Any laboratory press capable of delivering 10-15,000 psi is suitable.



System for extruding sodium wire: (A) press; (B) body & plunger, 2¼" mold; (C) die assembly; (D) die plate holder & adapter; (E) adapter for cutting sodium wire; (F) clamp; (G) sodium wire cutter; (H) cutter for cleaning oxide layer from feed stock; (I) & (J) bar & knockout rod for pushing plunger from mold body; (K) sodium feed stock; (L) tube for inert gas blanket; (M) bubbler indicating inert gas flow; (N) press oil-pump handle; (O) stopper (when tube not in use); (P) pressure gauge; (Q) inert gas inlet tube; (R) sodium wire.

Sodium wire extruded in this equipment can be used, as an example, for a standard Bouveault-Blanc reduction of diethyl sebacate to decamethylene glycol. In this reaction, carried out with sodium in a considerable excess of absolute ethanol at 85-95°C, the sodium must be added slowly because of its great reactivity with ethanol at the temperatures required. The extruded wire form is ideal for the purpose. Procedure for this reduction is described in detail in the U.S.I. technical data sheet entitled: "Laboratory Production and Use of Sodium Wire," which is obtainable upon request.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Industrial glycols are treated comprehensively in new 80-page booklet now available. Use as antifreezes, coupling agents, humectants, liquid coolants, resin intermediates, solvents described. Properties, handling included. **No. 1490**

A gas chromatography abstracting service has been formed to keep subscribers up-to-date on current developments. Foreign and U.S. journals are searched and technical papers reviewed. Abstracts are submitted on punched cards. **No. 1491**

N-ethyl- and N-methylmorpholine are now being offered as stabilizers for chlorinated hydrocarbons, catalysts for urethane foams, and to prepare corrosion inhibitors, waxes, all emulsifiers and drugs. **No. 1492**

Newly revised chemical elements wall chart now being sold includes newly adopted symbols such as Ar for argon, Es for einsteinium; technical uses of many elements; latest values for atomic weights and other numerical constants. **No. 1493**

Vitamin B_6 is subject of new 40-page brochure. This condensed, up-to-date report gives nutritional and clinical data, plus a review of the chronology, chemistry, pharmacy and occurrence in nature of the vitamin. **No. 1494**

To study animal behavior in response to stimuli, complete range of automatically-recording test equipment is now on market. Permits evaluating effects of psychotropic agents, tranquilizers, sedatives, stimulants, euphoriants. **No. 1495**

New creams said to protect against virtually any skin irritant commonly encountered in industry have been developed. Contain hexachlorophene for bacteriological, anti-fungus effects. Emollient prevents drying, cracking. **No. 1496**

New first aid aerosol spray is claimed to combine antiseptic, germicide, surface anesthetic, surgical dressing and fungicide, all in the one product. **No. 1497**

Synthetic bergamot oil, believed to be first essential oil ever produced entirely and successfully by chemical means, has been announced. Said to have advantages of low and consistent cost, dependable supply, uniformity, freedom from impurities, improved stability. **No. 1498**

New filter paper now being offered is thin plastic (cellulose ester) with millions of tiny pores. Resistant to heat, chemicals; biologically inert. Said to permit large-scale microfiltration to previously unobtainable standards of cleanliness. **No. 1499**

PRODUCTS OF U.S.I.

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Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Intermediates.

Heavy Chemicals: Anhydrous Ammonia, Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions, Phosphatic Fertilizer Solution, Sulfuric Acid, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide.

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Animal Feed Products: Antibiotic Feed Supplements, Calcium Pantothenate, Choline Chloride, Special Liquid CURBAY, Menadione (Vitamin K_3), DL-Methionine, MOREA® Premix, Riboflavin Products, U.S.I. Permadry, Vitamin B_{12} Feed Supplements, Vitamin D_3.

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Market Newsletter

CHEMICAL WEEK
July 18, 1959

Reichhold Chemical's recent phthalic price hike to 19¢/lb. —2¢/lb. more than posted by other sellers *(CW Market Newsletter, June 27)*—is now conceded by phthalic anhydride marketers to have been a shrewd maneuver. In light of current phthalic shortage, there's little doubt that RCI is moving its product easily despite the higher tab. The shortage is due to a dearth of naphthalene—in turn resulting from scare buying precipitated by the dragged-out steel wage negotiations. And phthalic importers, too, are profiting from the improved demand.

How soon the phthalic market will return to more normal supply/demand balance depends largely on resolution of the steel dispute. In any case, more phthalic sellers and producers seem likely to follow RCI's lead and post higher prices. Just when the increases will come, however, is moot. But it's likely to happen while the acid is in short supply.

•

There's a new twist in the potential price competition between *cis*-polybutadiene and polyisoprene *(see p. 53)*. Phillips now reports it can lower production cost of *cis*-polybutadiene (in large quantities) below that of polyisoprene although current tabs (on small quantities) on the butadiene material are still 5¢/lb. above the 30¢/lb. price of polyisoprene. Shell's reaction to the Phillips prediction: no comment.

•

Elimination of auto chassis lubrication may be brought closer by a new type of ball-joint suspension bearing and steering linkage bearing. Six '58-model taxicabs, fitted with the bearings made of Du Pont's Teflon TFE-fluorocarbon fiber, have been operated 50,000 miles without lubrication.

The bearings thus eliminated 36 greasings and resulted in a saving of about $54/cab during the test period. Major savings realized from the new bearings would accrue to those, such as taxi owners, who run their vehicles for about 300,000 miles; but savings for private passenger car owners would amount to an estimated $40-50/year.

•

Production of crude products from petroleum and natural gas for chemical conversion increased 15% from '57 to '58, while sales went up slightly from $376 million to $380 million. Gains were made in spite of the recession features of '58, according to the U.S. Tariff Commission's preliminary report.

Production of all aromatic and naphthenic products shot up 48% while sales increased from $87 million to $98 million. Aliphatic hydrocarbon production increased from 14,524 lbs. to 15,619 lbs.; sales volume also increased but dollar sales dropped from $289 million to $282 million. Butadiene output dropped from 1.5 to 1.4 million lbs.

Production of all tars (coal, water-gas, oil-gas) fell off 24%. Only toluene increased, by 21%; but dollar sales dropped from $33 million to $29 million. Output of road tar fell 25%.

•

Dow Chemical has completed construction of its Bay City, Mich., ethylene-polyethylene complex (35 million lbs./year ethylene, 30 million lbs./year linear polyethylene) and expects to have it in operation by end of summer. Shakedown operations on the ethylene unit are getting under way, test runs on the polymer installation will follow soon.

Raw materials will come from the nearby Bay Refinery (rated at 10,500 bbls./day, 6,000 bbls./day cracking plant) acquired by Dow.

•

Option on a big deposit of graphite ore discovered near Portland, Ont., has been picked up by Joseph Dixon Crucible of Jersey City, N. J. Dixon reportedly will "immediately" begin exploratory drilling of the deposit, described as "perhaps the largest graphite deposit ever discovered in North America." Sale price has not been disclosed.

•

A big uranium ore purchase contract—estimated at more than $15 million and running until the end of '66—has been signed by Susquehanna-Western and Vitro Minerals. The deal calls for delivery each year of ore containing 480,000 lbs. of uranium concentrate from Vitro's Gas Hill, Wyo., mines. Thus, Vitro will be operating at a rate of more than 100,000 tons/year (ore). Capacity of Susquehanna's Riverton, Wyo., mill —now 550 tons/day (ore)—may be increased in the near future.

•

Gulf Oil's new, 30-million-gal./year benzene plant at Port Arthur, Tex., is onstream. Feedstocks are drawn from the firm's refinery streams; a platinum catalyst converts the hexane-rich stream to a mixture rich in benzene, which is solvent extracted and distilled to produce high-grade benzene. Substantial amounts of toluene are also produced.

•

General Tire & Rubber has completed a $350,000 expansion that ups by 50% the firm's capacity for styrene-butadiene latex (called Gen-Flo.) The latex is used in rubber-based paints, paper coatings, textile backings and printing inks.

SELECTED PRICE CHANGES—WEEK ENDING JULY 13, 1959

DOWN	Change	New Price
Cocoa butter, bgs.	$0.01	$0.68
Eugenol, USP, dms.	0.05	2.25
Sodium thiosulfate, tech., anhyd., c.l., 100-lb. bags	0.45	7.75
Sodium thiosulfate tech., pentahydrate, photo grade, c.l., 100-lb. bags	0.30	4.95

All prices per pound unless quantity is quoted.

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NEW AMP FLOOR WAX EMULSIONS

Develop Water Resistance Fast!

Cost Less!

A new method for using 2-Amino-2-methyl-1-propanol in floor wax emulsions, developed by CSC's Research Department, has opened the way for a greatly improved product. The new method consists of slightly reducing the AMP content and incorporating aqua ammonia. The result: wax with excellent water resistance which develops very rapidly after the wax film is laid down.

In addition to the rapid development of water resistance with the new AMP-ammonia formulations, considerable savings in costs may be expected since less AMP is required. Other performance characteristics of the AMP-ammonia formulations such as shelf-life, freeze-thaw resistance, leveling, and gloss were fully equal to the best commercial formulations.

Proved By Performance Tests

In a series of tests, the new AMP-ammonia formulation attained "excellent water resistance" in less than *two-thirds the time* required, and at *one-third the cost for amine* when compared with a typical formulation using morpholine. A new technical data sheet describing these and other tests made with typical commercial formulations is available on request.

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INDUSTRIAL CHEMICALS DEPARTMENT

COMMERCIAL SOLVENTS CORPORATION

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IN CANADA: McArthur Chemical Co. (1958) Ltd., Montreal • IN MEXICO: Comsolmex, S. A., Mexico 7, D. F.

PHILIPPINES: Chemical outpost in the Far East

'57 Philippine trade in chemicals and allied products.
Source: Philippine Bureau of Census and Statistics.

Nationalism Threatens Filipino Trade Ties

U.S. process industries executives responsible for their firms' holdings in the Philippines last week were examining that regions latest nationalistic move for its significance to direct private investments. The move: passage by the now-adjourning Philippine Congress of a 25-40% "tax" on dollars used to purchase imports.

Labeled counterinflationary by the Philippine congress, the tax measure is a form of currency devaluation destined to force significant adjustments in the Philippine chemical and pharmaceutical industries.

Growing Problem: The swelling wave of nationalism—aimed, some observers say, at Westerners and their influence—became significant in '58, has grown steadily. Behind it is the continual shortage of dollars, compounded by graft and corruption, which has permitted the escape of millions of scarce dollars through the overevaluation of imports and the underevaluation of exports.

Ahead: constant threat of new legislation—such as the recent surcharge on foreign exchange—by a government seeking to replenish its funds.

During '58, there was a serious deterioration of the foreign investment climate, resulting from the government's restrictive actions on the economy. Because of the unfavorable balance-of-payments situation, and as part of the government's austerity program, approval of new investments requiring significant foreign exchange allocations were severely limited. Nevertheless, U.S. private investments —in excess of $400 million by then —continued, largely as a reinvestment of blocked accumulated earnings.

The stage had been set for the restrictive measures by President Carlos Garcia's state-of-the-nation address to the Philippine Congress in Jan. '58. He declared that, while foreign investment was welcome, "it should be admitted on a selective basis in order that legitimate Filipino business may be protected."

Many Monetary Restrictions: Chief among the restrictions that hamstring U.S. private investors are the dollar-licensing provision and the surcharge on foreign exchange. Dollar licensing was instituted in '49. Its purpose is to make certain that scarce dollars

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are reserved to purchase those imports most productive in the local economy.

Administered by the Central Bank, dollar licensing also works for exports, in that all dollars gained from the export of goods must be sold to the central banking system for local currency or credits.

In Dec. '57, the monetary board of the Central Bank ordered a temporary suspension of '56 profit remittances to foreign investors in the Philippines, pending a review of the critical balance-of-payments situation. Early last year, remittances based on '56 earnings were resumed, but it was announced that until further notice remittances based on '57 earnings would be at only 75% of the rate normally permitted. The 25% reduction later was applied to remittances based on earnings for the first nine months of '58. And, in September of last year, there was a suspension of all profit remittances on earnings accumulated after Sept. 30, '58, pending a restudy of the over-all remittance formula, which had been in effect without major revision since '56.

Further Restrictions: In another restrictive action late last year, the monetary board tightened regulations governing disposition of the blocked, accumulated peso funds.

Worrying foreign investors was the requirement that all such funds had to be deposited in special blocked fiduciary accounts with commercial banks before Jan. 16 of this year.

Potentially the most significant official action affecting foreign investments was the adoption last August of a policy to give preference to Filipino-originated investment proposals and requests for foreign exchange. Later, the National Economic Council tightened conditions for joint investment ventures, stipulating that participation of aliens in the capitalization of joint-venture enterprises must not exceed 40%. At the same time, the Central Bank announced that for fourth-quarter '58 it would allocate exchange for new industries only under two conditions: (1) that they be dollar-producing or (2) wholly Filipino owned and highly essential dollar-saving industries that would use at least 90% domestically available raw materials.

Aim of these measures: to have Filipino manufacturers meet the needs of the country in all fields, including drugs and pharmaceuticals.

Investors Squeezed: But as a result of these stringent restrictions and the threats of new monetary controls, new foreign investors in the Philippines are hard to find. Only one American firm is planning entrance into the country now, and its tie-in with a Filipino firm is so complicated the concern refuses to talk about it.

Filipinos welcome investment by any American company with dollars to spend, and favorable laws permit the remission of capital and profits. However, there are seldom any dollars left over for this purpose. Consensus is that it would be difficult for a U.S. firm to set up a subsidiary with less than 51% Filipino ownership.

In sum, the major difficulty of doing business in the Philippines is that the foreign firm finds itself at the mercy of a variety of government bureaucrats on a day-to-day basis. Established foreign firms have seen their dollar quotas cut from the original level set when controls were established. At the same time, they have seen Filipinos who are ostensibly "new importers" get dollar licenses and resell them to the highest bidder. And even the very low, 20% corporate tax rate most likely will be raised to 22½%.

Advantages Exist: Despite these factors, however, the Philippines—a strategically located group of 7,100 islands inhabited by some 15 million people—offer great promise of industrial growth in every direction, including the chemical industry. Now that hundreds of new factories are in operation, one of the best opportunities lies in the production of basic chemicals. Chemical raw materials are in short supply; most are imported.

Total book value of the 252 registered establishments (corporations, partnerships and sole proprietorships) in the chemical and allied products field at the end of '56 was $37.8 million. During '57, 69 new organizations were registered, showing a paid capitalization of $1.4 million. And from January to September, in '58, an additional 80 firms were registered, with a paid-in capitalization of $980,000. Of the last group, 39 were sole proprietorships, with a total capitalization of $265,000.

Using '55 as a base of 100, physical production of the Philippine

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Amides . Amines . Quaternaries

A broad new line of fatty nitrogen chemicals is now available in production quantities from ADM . . . including some interesting compounds never before offered commercially.

We call them Adogens. Included are primary, secondary and tertiary amines, quaternary ammonium compounds and amides. They are derived from coco, tallow, hydrogenated tallow and marine fats and oils. The Adogens include the widest variety of amides commercially available.

An ADM innovation is the creation of tri-fatty amines and other complex tertiaries through a novel ADM process that makes possible selective control of the chains added.

The Adogen line is also the first to offer extremely long chain fatty nitrogen chemicals in the arachidyl and behenyl range. These C_{20} and C_{22} compounds offer a number of interesting new characteristics.

Such extra-long-chain Adogens are possible because of ADM's unique position in the marine oil field. We long have been leaders in the chemistry of fish and marine oils, going so far as to run an extensive whaling operation. Because of our basic position, we can offer long-chain amines from these raw materials at attractive commercial prices.

The same close control of other raw materials, and ADM's position as a basic fatty acid producer, insure top quality throughout the Adogen fatty nitrogen chemical line. All of the Adogens show excellent color. The new ADM fatty amides and fatty quaternaries, in particular, promise users the advantage of whiter end products because of their lighter color. Adogen primary amines and amides have excellent stability in storage.

For further information on fatty nitrogen chemicals, write our Development Department.

Write for 52-page catalog on other aliphatic chemicals.

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chemical industry increased to 127 by the end of '57. By second-quarter '58 —the latest period for which statistics are available—the chemical production index had reached 130. The index for all manufacturing was 133.

During '56, chemical firms spent $80.4 million for raw materials, containers and overhead in the manufacture of chemical products that sold for $146.1 million, representing $45.8 million in value added by manufacturing.

The greatest area of growth in the Philippines has been in the pharmaceutical-making areas. Paint manufacturing is another rapidly growing field that has had large American participation since exchange controls went into effect. In addition, three fertilizer plants are in operation; largely using imported sulfur as the main acid raw material. There is no petrochemical industry in the Philippines, although one refinery is operating, two abuilding.

In addition, the Philippines is a peaceful, English-speaking country. American investors and traders receive preferred treatment under a trade agreement; and in the event that trade is opened with Red China, U.S. manufacturers based there would have a tremendous advantage in shipping time and freight charges.

Legislation Needed: The one thing that is needed most, according to observers, is a foreign-investment law that would firmly establish the relationship between foreign investors and the government. The best course, they say, is one of watching and waiting to see which way the political wind blows. It is believed that a rather influential segment of intellectual Filipinos has written off the U.S. in Asia, is trying to realign the nation with Red China. Time and the effect of present policies will provide the only real test for this theory.

LABOR

GAF Boost: An 8¢/hour pay boost was granted 400 employees of General Aniline & Film's Ozalid Division plants in Johnson City, N.Y., and Vestal, N.Y., under terms of a two-year contract negotiated between Ozalid and Lodge 1807, International Assn. of Machinists, AFL-CIO. Terms call for an additional 7¢ one year from now. The contract also calls for modification of vacation plans and revisions of contract wording. Remainder of the 850 Ozalid employees are not union members.

•

New Round: A new round of tense negotiations in the rubber industry is coming up. Earlier this year, United Rubber Workers and rubber manufacturing companies agreed on fringe benefits and pensions and insurance agreements. Now, URW has notified Goodyear Tire & Rubber Co. it wants to reopen company-wide contracts for bargaining on wage increases.

•

Teamster Rebuff: In its first bid to enter the phosphate fields of Florida, the Teamsters Union was dealt a heavy blow at the Bonnie plant of International Minerals & Chemical Corp. near Bartow. Workers, already represented by International Chemical Workers Union, voted three to one to stick with ICWU, in a National Labor Relations Board election requested by the Teamsters. The vote: 73 for the Teamsters, 218 for ICWU, 18 votes challenged; 397 employees were eligible to vote.

LEGAL

Advertising Practices: If a product is demonstrated in advertising, the demonstration must be a valid one in support of claims made for the product. This trade-practice principle was set down in a recent Federal Trade Commission ruling involving Hutchinson Chemical Corp. (Chicago) and its product, Waterproof Wax.

The ruling, in an opinion by Commissioner Sigurd Anderson, adopted with modifications an initial decision by an FTC hearing examiner. The examiner had ordered dismissal of a charge that Hutchinson's "flaming automobile" television commercial deceived the public.

The commercial showed the wax being applied to a car, which was then sprayed with gasoline, ignited and then extinguished with water after 12 seconds. The FTC complaint charged that this was deceptive in that it falsely represented that the demonstration proved the product was both heat- and cold-resistant. In dismissing the complaint, the examiner said the commercial did not make the alleged representation.

The commission offered a different

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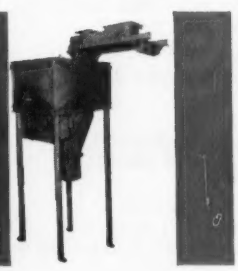

☐ We are interested in improving our bag.
☐ We are interested in your Kraftpacker.

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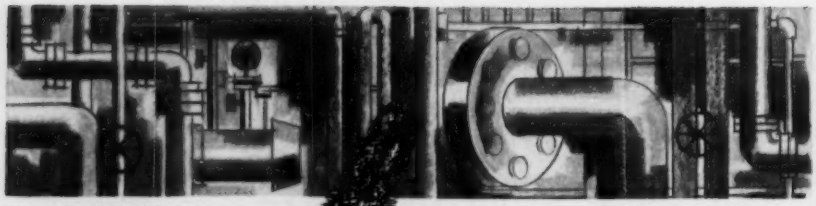
CITY_____ ZONE____ STATE____ PRINCIPAL_____

PRODUCT MFD._____



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you can enjoy *continuous quality control during production.*

The AutoAnalyzer conducts continuous automatic wet chemistry determinations with a precision of ±1%...without attendance. Feedback loops for automatic control are now completely feasible.

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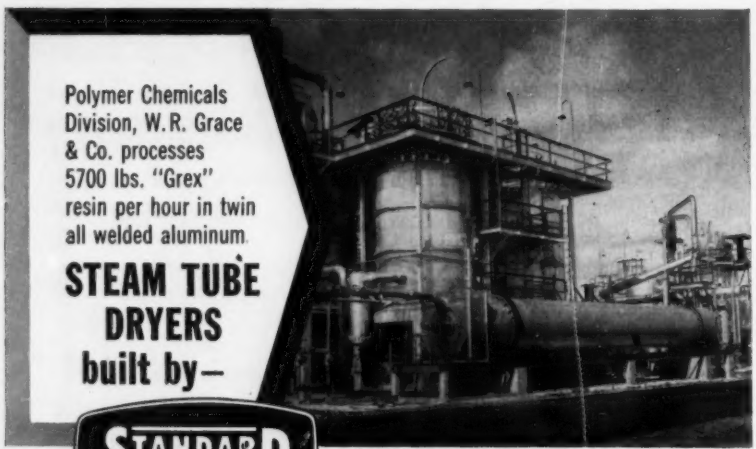

Polymer Chemicals Division, W.R. Grace & Co. processes 5700 lbs. "Grex" resin per hour in twin all welded aluminum

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These twin rotary dryers are aluminum. STANDARD, of course, also makes dryers of other materials. What makes Standard Steel the important name in dryers? Several things. For one, pilot plant studies make sure they will do the job well. For another, STANDARD dryers are built to last. Take a close look at the heavy-duty trunnions, thrust rolls, gears, tires, modern drives, anti-friction bearings, metal to metal seals. There's good stuff in Standard Steel products. Let our engineers help you with drying problems.

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ADMINISTRATION

reason for dismissal. It said the ad, if proved to be untrue, as alleged, would have been an unfair trade practice because it would have been misleading. But, the commission added, there was insufficient proof that the demonstration was untrue.

•

Negligence Suit Dismissed: A negligence suit against Helene Curtis Industries has been dismissed in U.S. district court in New York. The suit claimed that Vera J. Hokanon received injuries from use of a Helene Curtis product because of negligence on the part of the firm.

The court dismissed the suit on the question of validity of the service of the summons and the complaint. Attorneys for the woman served the Secretary of New York State instead of Helene Curtis.

KEY CHANGES

George F. Halfacre to vice-president in charge of manufacturing, New Jersey Zinc Co. (New York).

L. E. Doxsie to manager, Corn Division; **F. W. Apperson** to manager, Grocery Products Division; A. E. Staley Manufacturing Co. (Decatur, Ill.).

Herbert H. Fink to vice-president—development, B. F. Goodrich Industrial Products Co., division of B. F. Goodrich Co. (Akron, O.).

Frank Zeitlin to assistant vice-president, Mallinckrodt Nuclear Corp., subsidiary of Mallinckrodt Chemical Works (St. Louis).

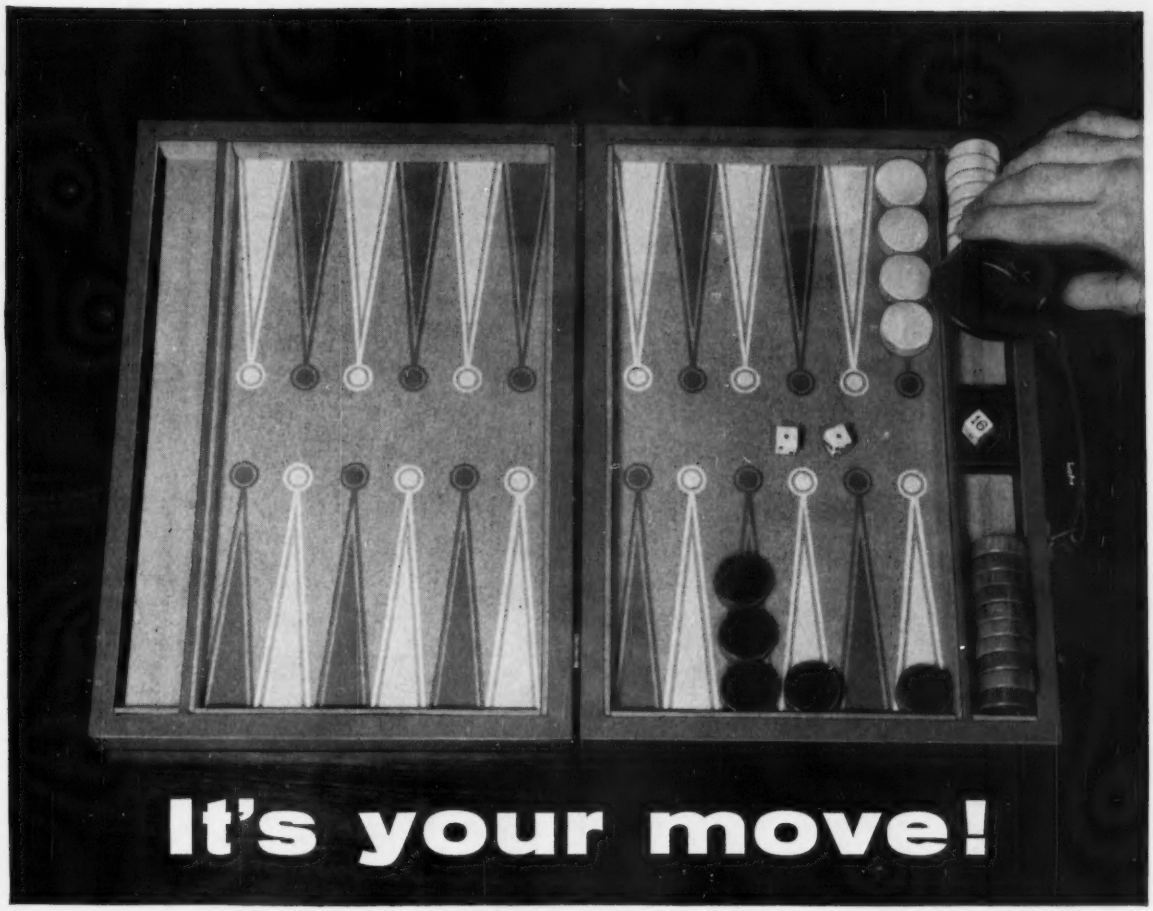
H. G. Hinck to senior vice-president, Wallerstein Co., division of Baxter Laboratories (Staten Island, N.Y.).

Robert Q. Parks to general manager, Grace Chemical Division of W. R. Grace & Co. (New York).

J. Howard Olehy to vice-president, Petroleum Chemicals, Inc. (New Orleans).

Stanley Lewis to director of marketing, General Aniline & Film Corp. (New York).

William Feick, Jr., to vice-president in charge of sales, Flintkote Division; **James E. McCauley** to treasurer, **Gene G. Curry** to secretary; Flintkote Co. (New York).



PROBLEM: In this backgammon situation you, playing black, and your opponent, playing white, have borne off ten and eleven men, respectively. White, at this point, has the edge, but you have just cast double ones. What would you do?

WYANDOTTE'S POSITION as a producer and supplier of chlorine and caustic is strengthened with the completion of a new caustic-chlorine facility at our Geismar Works, immediately south of Baton Rouge, Louisiana . . . home of our second ethylene glycol plant.

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The possibilities are exciting — and unlimited. Why not write us for information . . . or a get-together. *Wyandotte Chemicals Corporation, Dept. 695, Wyandotte, Michigan. Offices in principal cities.*

ANSWER

You should play the man off the 1 point and play the three men down from the 4 point to the 3 point. White will go out in two throws and your only chance to win is in rolling a high double. If you were to bear off the men on the 1 and 3 points, then the only doubles that will win are fours, fives, or sixes. By playing the three men down from your 4 point, however, double threes would also win.

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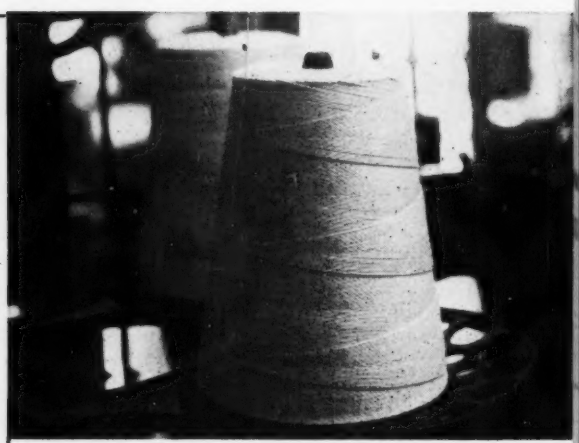
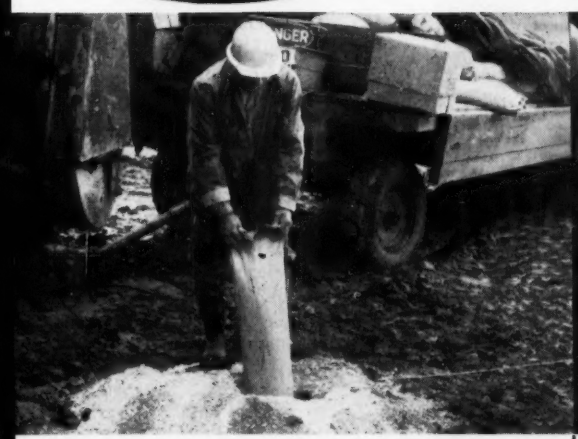
may solve
your problem . . .



"GOLDEN-PLY" IS GOLD IN YOUR POCKET . . . That's what new Bemis Golden-Ply* Acid-Resistant Thread for sewing patented seams in multiwall and waterproof bags can mean. Highly acid-resistant synthetic filaments are twisted with golden-yellow quality Bemis cotton thread. Many acid-bearing chemicals now reach their destination safely. Needle-smooth and economical. Better try it.

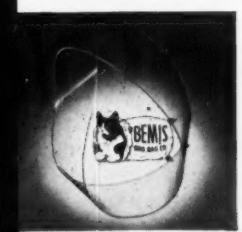
*Trademark

PROTECTION?



EVERY TIME YOU BLAST, YOU SAVE . . . Bemis Explosives Bags (for mining and industrial explosives) can save amazingly. Example: You are a mine operator using cans (which cost about 70¢ each), load 10 cans per hole and shoot 60 holes per day. Container cost: $420 per day. Bemis Explosives Bags cost only 20¢ to 25¢ each. 10 x 60 x 25¢ equals $150 . . . *a saving of $270 per day.*

MUSCLE-BUILDER FOR MULTIWALLS . . . If your multiwall bags are a trifle light for their job, you needn't add a full ply. Save money by switching to job-tested Bemis Strength-end Multiwalls, with added strength top and bottom (shown under cut-away ply), where most sewn-bag breakage occurs. Or, if you're OVERpackaged, eliminate a full ply and substitute Strength-end® protection.



Bemis where *flexible* packaging ideas are born

Bemis may already be making the better package you need.
***Write:* Product Development, 408-J Pine Street, St. Louis 2.**

Fiery Magic

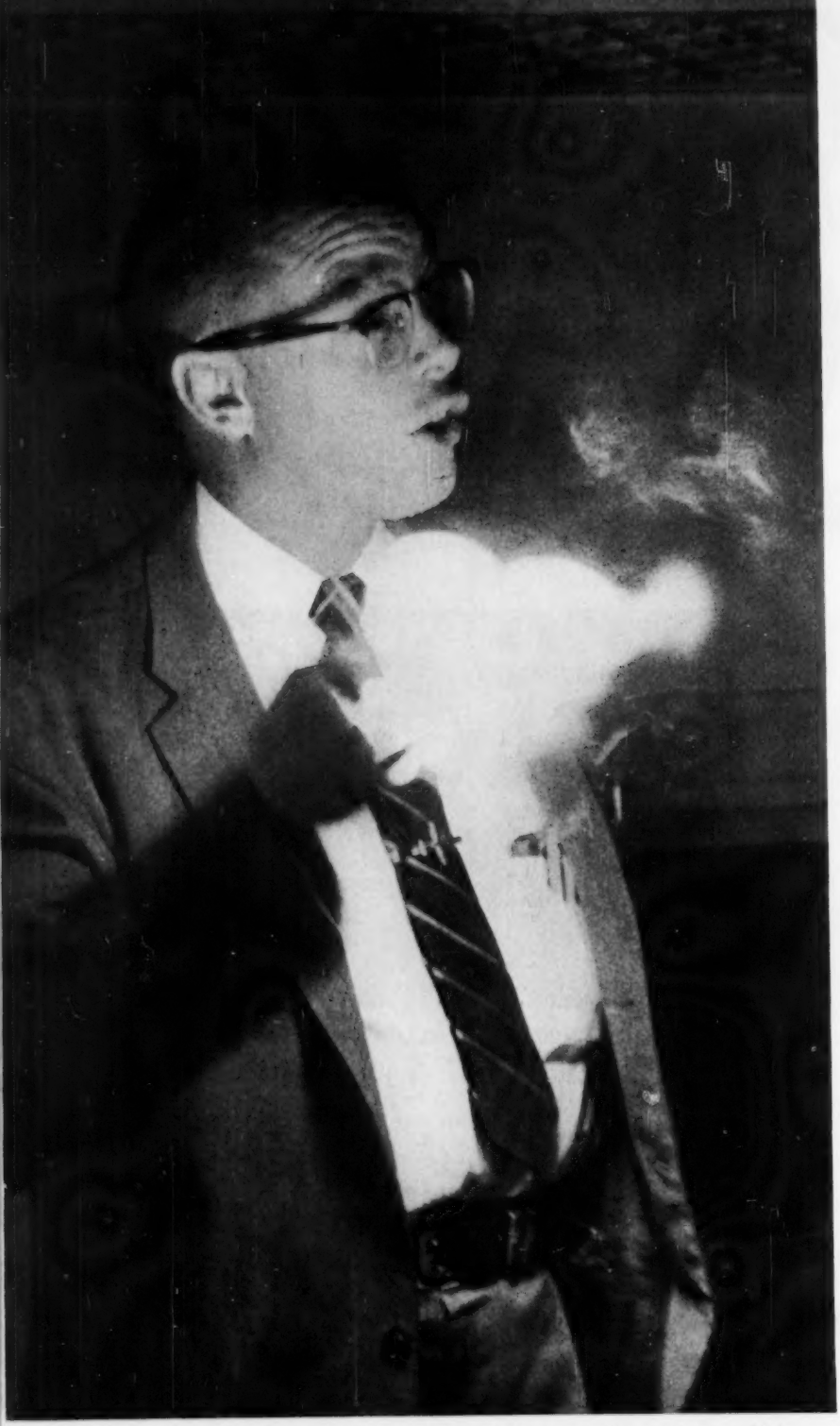
Behind the blazing ball of fire in the photo at the left, a chemical salesman is at work. Strange as it may seem, Allied Chemical's Daniel Anderson finds magic a remarkably useful sales tool in selling fluorocarbon refrigerant and aerosol propellent gases in his Houston, Tex., territory.

Magic, says Anderson, has been responsible for numerous speaking invitations by groups of potential Allied customers—e.g., at local meetings of the American Chemical Society and refrigeration and air-conditioning technologists. The latter often have great influence on refrigerant gas purchasing. Anderson's blend of magic tricks and "soft sell" salesmanship sometimes nets him as many as five to eight invitations per month.

The payoff from a bagful of magic tricks goes beyond a solidly booked engagement calendar. Skill with sorcery frequently opens the door to purchasing agent offices and sometimes lets Anderson take more-than-usual time to talk up the merits of his wares. A carnation that suddenly flips from one lapel to the other, Anderson finds, is a sure way to rivet the attention of a weary purchasing man.

Moreover, integration of several stunts with a technical discussion often helps nontechnical people understand complex chemical technology. Case in point: molecular models of fluorocarbons. They suddenly appear in his hands, when needed to explain the differences between the many similar chemical structures. A flammable chemical is dramatized by a sudden burst of flame from an apparently empty hand.

Allied sales management welcomes Anderson's free-wheeling approach to chemical selling. Allied products get star billing in Anderson's shows. His sales record indicates purchasing agents are responsive to the subtle sales pitch. Only recently, for example, a hard-to-see vice-president tabled a business discussion to watch a sales-magic presentation. Customers, Anderson tells *CW*, are usually first amazed, then amused, and almost always keenly interested. Adverse reactions are almost nonexistent.



His hand trailing cloud of smoke, Anderson talks of flammability.

Sparks Salesman's Novel Pitch

Anderson got started in magic during student days at Emory University (Georgia). When he took up a sales career, he found a need to socialize with customers. Most salesmen, says Anderson, "do this by playing golf, sipping a casual cocktail or playing poker. I don't drink, I hate golf and anyone would have to be out of his mind to play poker with me. Magic has usually filled the void nicely."

About 30 tricks comprise Anderson's repertory. Most are designed to be easily managed in sales calls or fit the standard salesman's attache case. That calls for ropes that cannot be cut shorter despite numerous snips, disappearing thimbles, penknives that change color instantly, and newspapers that Anderson swiftly tears into intricate patterns. He often uses the latter to gain audience rapport by forming the emblem of the particular group he is addressing (*see picture below*).

Anderson's favorite stunt involves asking a purchasing agent to name a card, then giving him a boxed deck with the designated card lying on top.

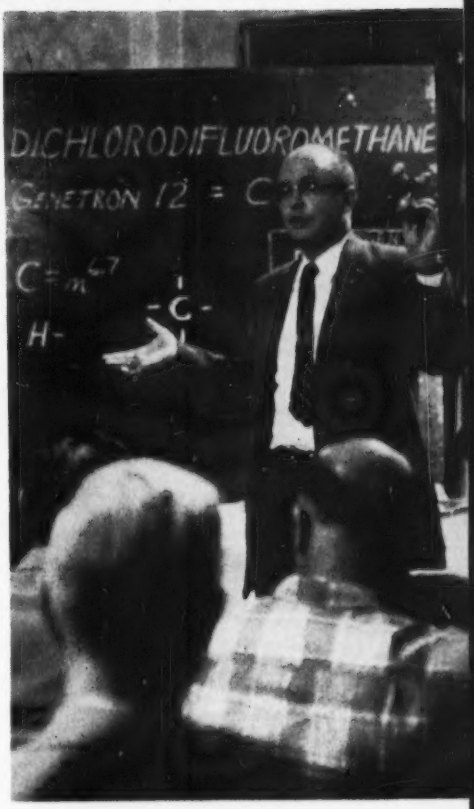
Anderson uses the tricks during most of the 15 to 20 sales calls he averages every week. And they are a prime attention-getter in the 40-60 lectures he makes each year to professional organizations. He has also been called upon to enliven company sales meetings.

Popularity with purchasing offices and on the podium often places severe demands on Anderson's time; on occasion, he flies his own plane on business trips—hence his billing, "Flying Sorcerer of the Southwest."

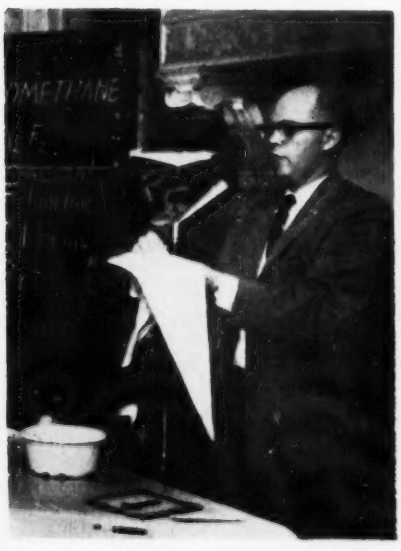
Although magic has proved useful in breaking the ice with purchasing agents and winning time for Allied's products on lecture programs, Anderson emphasizes that "salesmanship isn't magic." He avoids letting magic take a prospect's attention from the main point of his call.

Like most chemical sales representatives, Anderson relies chiefly on extensive product knowledge and standard sales techniques to keep his order book filled. Magic is the attention-getter.

Despite what it does for Anderson, magic isn't likely to blossom in every salesman's approach. For one thing, professional skill takes years of practice. And some sales managers would question the wisdom of diluting precious interview time with entertainment. But the magician's art has proved effective in giving at least one salesman "that something extra."



Models materializing from nowhere dramatize structure.



CW PHOTO—LEON TRICE

Anderson tears paper for 'sunburst' trick. Emblem of group he is addressing is often used as pattern.

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Easier Air Freighting

Simpler arrangements for overseas air freight shipments of chemicals are on the way. Recently, Air Express International Corp. (New York) listed "door-to-door" rates on both east- and westbound chemical air freight shipments to France.

Earlier, AEI had reported the first of its new "memorandum tariffs"—price lists—for "door-to-door" chemical air freight to Switzerland.

The system simplifies billing on shipments by consolidating all export-import charges, except duty, into one bill. Result: shippers will be able to figure total costs of an overseas shipment easily, get one total bill instead of many.

AEI's former billing system, still widely used by freight forwarders, consists of a base price from airport to airport—with a myriad of accessorial charges for other services such as pickup and delivery, preparation of documents, customs clearance, flight booking, insurance.

Switzerland was picked for the first of these shipments because of the large volume of pharmaceutical freight handled between the two nations. AEI tells *CW* other "Common Market" nations will be brought into the plan soon.

Maximum shipment value under the plan is $250, because higher values would require a formal record by customs inspectors, with a corresponding increase in handling and expense, and perhaps some loss of time. AEI will handle larger shipments but only with special surcharges added.

AEI also is now fighting to prevent the entry of American Express Co. into the burgeoning international air freight forwarding business. AEI, along with Acme Air Cargo and the Air Freight Forwarders Assn., are opposing American Express's application, now pending before the Civil Aeronautics Board. They claim that American Express's far-flung international banking and financing operations would give it an "unfair" advantage.

Ethylene by Truck

Truck transportation of liquid ethylene may be the next move in petrochemical distribution. This 37,000-lbs.-capacity trailer is reputed to be the first built in the U. S. for hauling liquid ethylene. Shipping liquid — rather than gaseous—ethylene permits much greater and more economical loadings. Union Carbide designed the trailer — providing special insulation and tank strength—to permit hauls of as much as five days under the hot Texas sun. Because an expected ethylene surplus failed to develop, the firm sent the unit to its Canadian operations, where the truck is now in service.

DATA DIGEST

• **Polyester catalysts:** New bulletin describes recent research on the use of catalysts in preparing neopentyl glycol polyesters through reaction of dibasic acids with neopentyl glycol. Eastman Chemical Products (Kingsport, Tenn.).

• **Urethane compounds:** Seven-page brochure describes polyester-di-isocyanate systems and polyether-di-isocyanate prepolymers for use in urethane elastomer potting materials. Data on procedures and formulations is included. Mobay Chemical Co.

• **Polyurethane applications:** Eight-page folder discusses major applications of solid polyurethanes in mechanical parts, diaphragms, belts and sheets. Disogrin Industries, Inc. (510 South Fulton Ave., Mount Vernon, N.Y.).

• **Vacuum metalizing:** Brochure (18 pages) explains use of vacuum metalizing spray coatings on thermoplastics, thermosetting plastics, metals and glass. Bee Chemicals Co., Logo Division (12933 South Stony Island Ave., Chicago 33).

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Technical Service—An excellent opportunity for young man to join the Technical Department of the expanding Plastics Division of Spencer Chemical Company. This man should have a strong background in chemical engineering or chemistry, with a minimum of three years experience in the field of polyolefins. He will conduct studies on extrusion and molding of polyolefins and nylon, ad have itimate contact with field technical service work. In reply, please send detailed resume of experience, education and salary requirements to: Personnel Manager, Spencer Chemical Company, 610 Dwight Building, Kansas City 5, Missouri.

Chief Chemist—Rapidly growing heavy chemical manufacturer in North Jersey has an opening for a Chief Chemist preferably with sulfuric acid experience. Advancement opportunities available. All replies confidential. P-1924, Chemical Week.

Development Engineer: Excellent opportunity for young graduate engineer with 2-3 years Process Development experience to join our expanding Nuclear Fuels Department. Previous nuclear fuels experience desirable but not essential. This is a challenging position as a development engineer, encompassing a broad area of nuclear fuels technology and offering the opportunity for future advancement. In reply, please send complete resume of experience, education, age and salary desired to: Personnel Manager, Spencer Chemical Company, 610 Dwight Building, Kansas City 5, Missouri.

Not Advancing Fast Enough? Need assistant to overburdened president of rapidly-growing established small chemical company. Business acumen a must, market research helpful. Tough interesting job, commensurate pay. Send resume to Aceto Chemical Co., Inc., 40-40 Lawrence Street, Flushing 54, New York.

Opening for research and development chemist experienced in manufacture and use of wax compounds, wax emulsions, resins, polymer dispersions, cleaners and household chemicals in a manufacturing company laboratory located in the Middle West. Apply by letter, enclosing photograph and giving full details of education and experience. All replies will be confidential. P-1975, Chemical Week.

Chief Engineer—Chemical Engineer required with at least 7 years experience. Requires a person with initiative and imagination and the ability to get things done. Must be able to provide technical assistance on process studies, anticipate future improvements and provide process designs to accomplish improvements. Outstanding opportunity for qualified engineers interested in growing with an expanding company. Salary is open. Submit detailed resume to: 2928 W. 77th St., Inglewood 4, Calif.

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General Manager of small specialty corporation seeks like position. Proven producer. Ph.D. Mid-west only. PW-2109, Chemical Week.

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Acids Surplus Wanted—Chemicals, Pharmaceuticals, Oils, Plasticizers, Resins, Dyes, Solvents, Pigments, Etc. Chemical Service Corporation, 96-02 Beaver Street, New York 5, N. Y. HAnover 2-6970.

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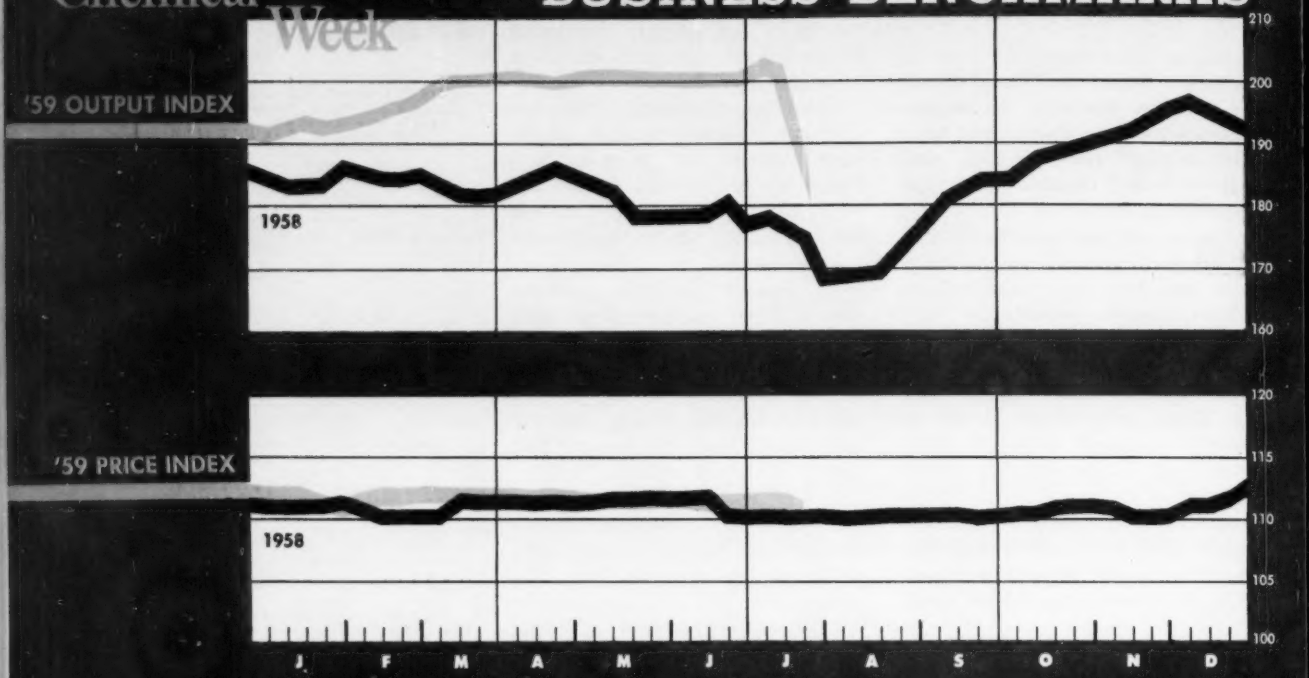

JULY 18, 1959

WEEKLY BUSINESS INDICATORS	LATEST WEEK	PRECEDING WEEK	YEAR AGO
Chemical Week output index (1947-1949=100)	185.0	202.5	169.0
Chemical Week wholesale price index (1947=100)	110.5	111.9	110.6
Stock price index (12 firms, Standard & Poor's)	60.15	58.67	39.91
Steel ingot output (thousand tons)	2,357	2,215	1,442
Electric power (million kilowatt-hours)	13,200	13,749	11,210
Crude oil and condensate (daily av., thousand bbls.)	6,913	7,025	6,423

MONTHLY INDICATORS—Employment (millions)	LATEST MONTH	PRECEDING MONTH	YEAR AGO
All manufacturing	16,135	16,029	15,023
Nondurable goods	6,721	6,720	6,543
Chemicals and allied products	845	846	817
Paper and allied products	553	552	539
Rubber products	232	240	231
Petroleum and coal products	237	237	238

CHEMICAL CUSTOMERS CLOSE-UP

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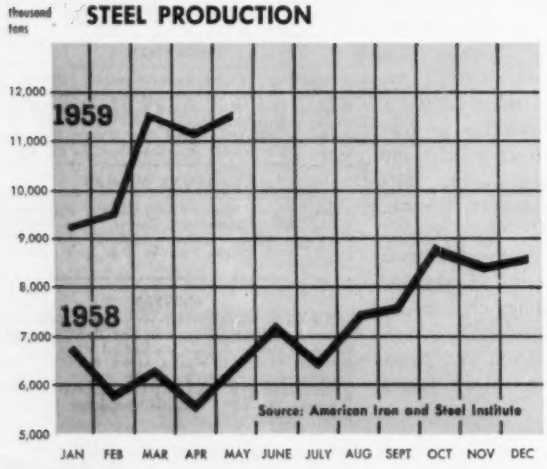

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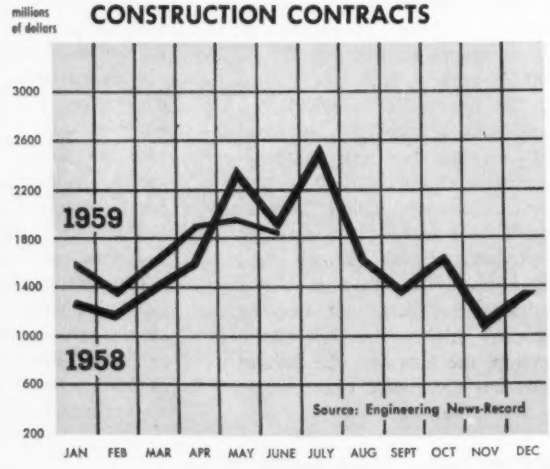

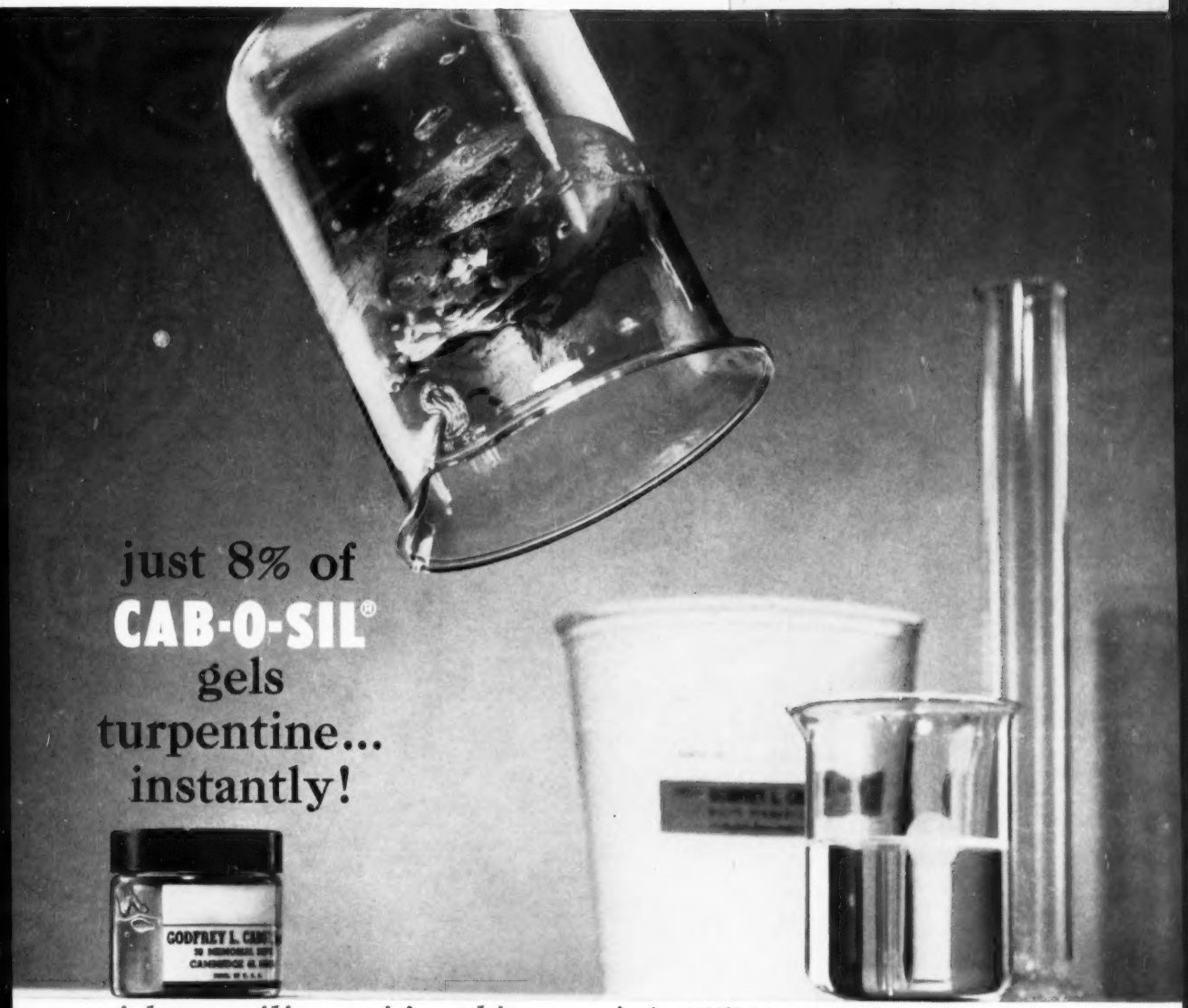

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- **Reinforcing agent** — rubber, silicone, latex film
- **Anticaking agent** — sulfur, insecticides
- **Antislip agent**—solvent-base floor waxes
- **Precoating material** — reproduction paper
- **Low temperature thermal insulation**
- **Pharmaceuticals and cosmetics** — **(See bulletin #cpha-1)**

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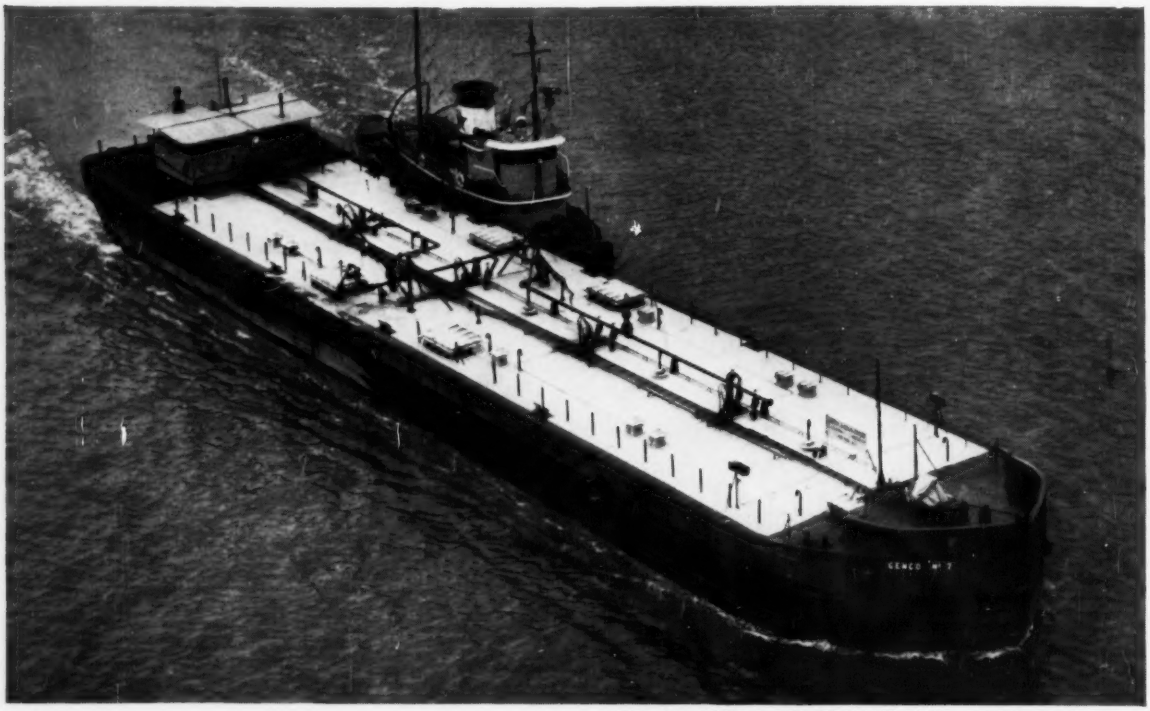


Capacity—2000 tons of sulfuric! *The "Genco 7" is the largest in General Chemical's fleet of eight sulfuric acid barges.*

Call on **GENERAL CHEMICAL** for ***Sulfuric Acid*** *...As you need it! ...When you need it! ...Where you need it!*

Whether your sulfuric acid requirements are measured in thousands of tons or carboy lots, General Chemical is best equipped to handle your order.

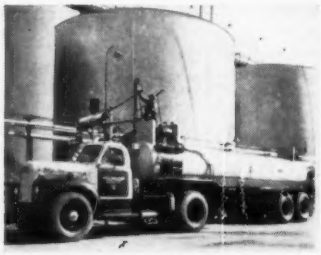
General's extensive network of production facilities plus its large and flexible transportation system assures you of sulfuric as you need it . . . when you need it . . . where you need it!

For example, we have eight sulfuric barges serving customers along the Atlantic coast and on inland waterways. Three operate out of Marcus Hook (Philadelphia), Pa. Two in the New York City area, including the 2000-ton capacity "Genco 7" shown above. Three on inland waterways. General also operates the largest fleets of sulfuric tank cars and tank trucks in the country.

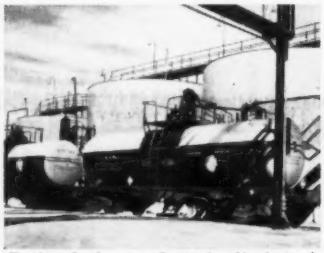
General Chemical has 21 sulfuric plants,* as well as stock points in key industrial centers across the country. Each is geared to meet regional requirements, offering customers the advantages of "next door" location to General's modern facilities. In addition, the output of one plant backs up that of another, making a coast-to-coast supply line which proves invaluable in meeting emergencies or unexpected demands.

Why not find out how our long experience and extensive facilities can benefit you? For further information, write or phone the nearest General Chemical sales office.

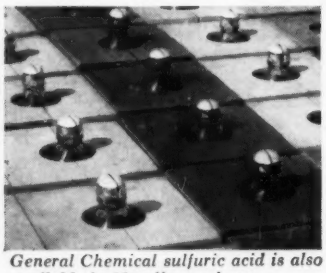
**In Canada: Allied Chemical Canada, Limited*



Large fleets of tank transports provide fast over-the-highway service.



By far the largest fleet of sulfuric tank cars is operated by General Chemical.



General Chemical sulfuric acid is also available in 13-gallon carboys.

Allied Chemical

GENERAL CHEMICAL DIVISION
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